









# HOME FURNITURE MAKING

For Amateur Wood Workers,  
Manual Training Schools and  
Students.       :       :       :       :

CONTAINING

CLEAR DETAILED DRAWINGS AND PERSPEC-  
TIVE DRAWINGS OF ALL EXAMPLES  
PRESENTED.

By  
G. A. RAETH



CHICAGO  
Frederick J. Drake & Company  
PUBLISHERS

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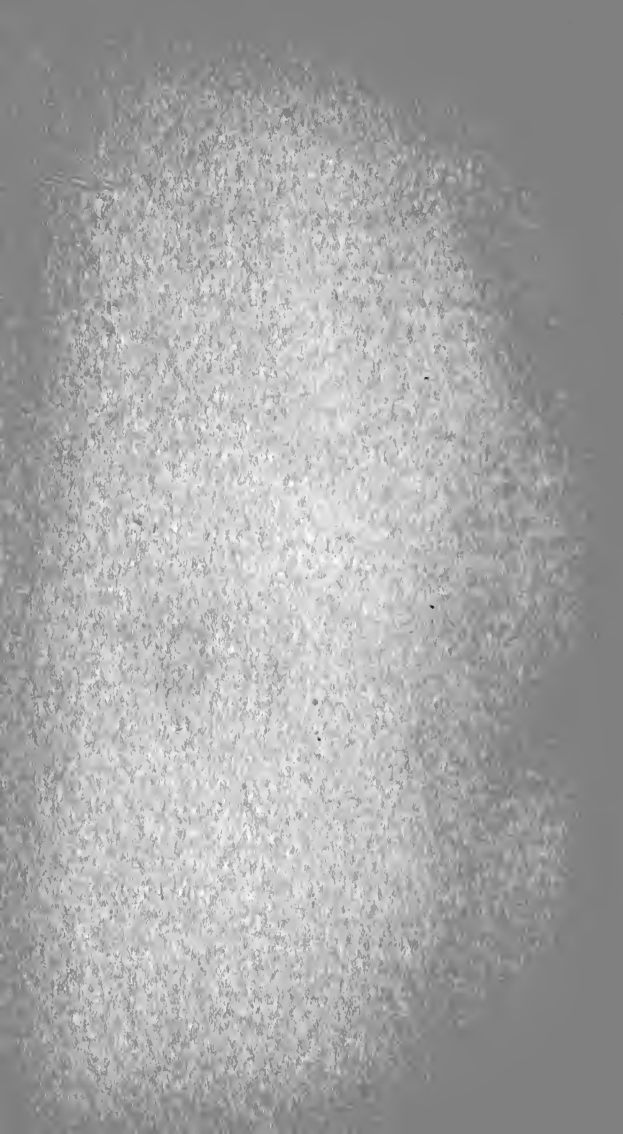
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## HOME FURNITURE MAKING

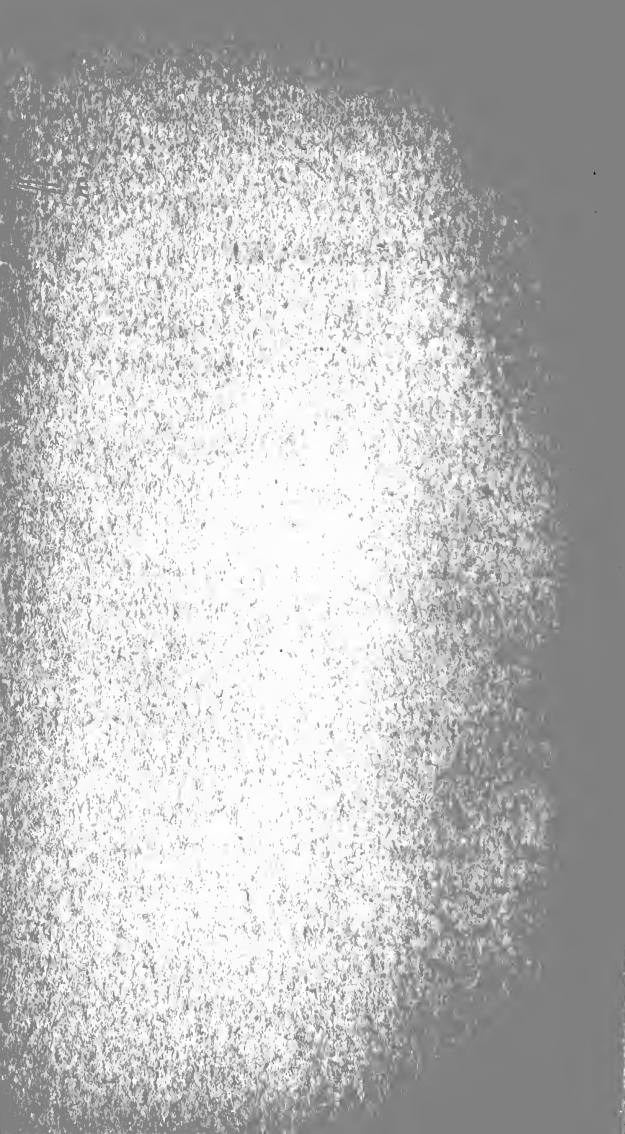
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## PREFACE

The purpose of this book is manifold. To the manual training instructor the book will be of intrinsic value as a text in his class work; to the manual training student, it will readily suit its purpose in cabinet making or in creating new designs of furniture and to the manual training enthusiast of the home, this work will prove itself to be a valuable addition to other books of this nature.

Simple household furniture has been chosen as the general theme and all the specific drawings and articles conform with the present demand for lines of simplicity and impressiveness, securing utility and comfort as well as artistic effects. The working drawings are characteristic of the kind of furniture which the public has indorsed

under the names of mission, puritan, arts and crafts and others.

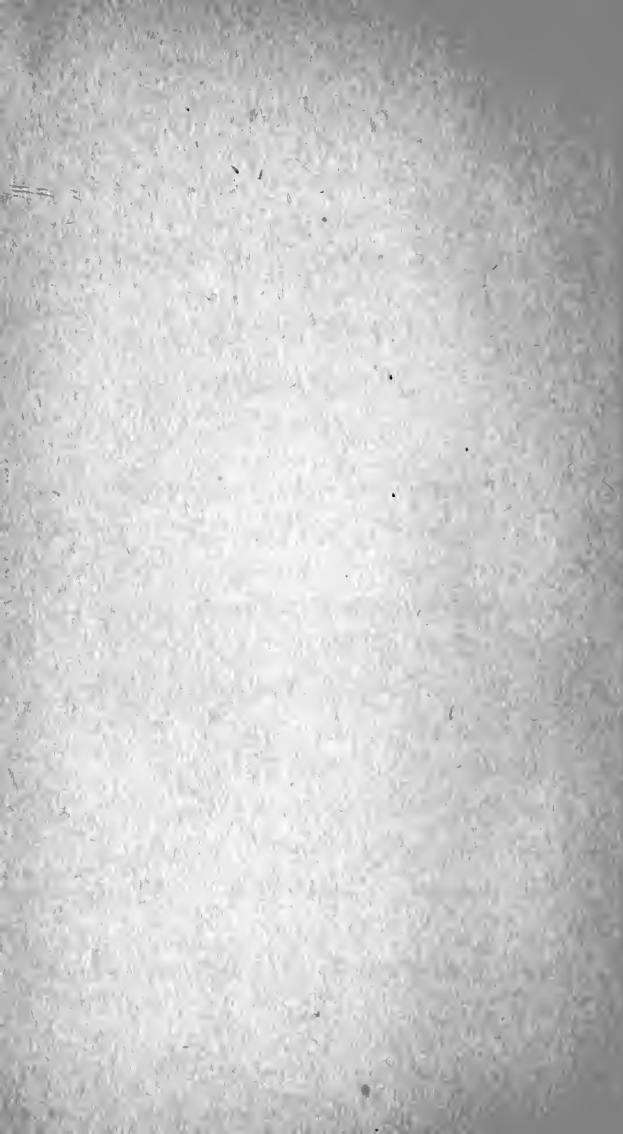
No furniture is presented which it will not be possible for any one familiar with the ordinary tools of carpentry to make. The same general form of construction is used in all, though there is a variety of forms in which the finished product appears.

As we all know, hand made furniture is one of the most desirable features of the home at the present time. Its artistic value makes it impossible for those of limited means, however, if it must be purchased from professional craftsmen. On the other hand, the simplicity of its lines, the chief characteristic of its beauty, makes it possible for the handy amateur to reproduce the most costly pieces and it is for this amateur, principally, that this book on Home Furniture Making has been perfected. The lessons for each group of drawings proceed by easy stages also, so that the amateur who



has succeeded with one or two will find it a simple matter to construct the more pretentious articles.

THE AUTHOR



# Home Furniture Making

## PLATE RACKS

By G. A. Raeth

### ARTICLE I

The plate racks shown on this page are of simple construction. Their parts can be fastened by means of blued round head screws, finishing nails, dowels or pegs as shown in drawing No. 2.

For the plate rack No. 1, the following pieces will be needed:

Two sides— $\frac{5}{8} \times 5\frac{1}{4} \times 12\frac{1}{2}$  inches.

One shelf— $\frac{5}{8} \times 5\frac{1}{4} \times 22\frac{1}{2}$  inches.

Two strips— $\frac{1}{2} \times 2\frac{1}{4} \times 23\frac{1}{2}$  inches.

One dowel— $\frac{1}{4}$ -inch round, 23 inches long.

These pieces can be ordered mill planed

on two surfaces to the thickness specified above and also sandpapered. Quarter sawed white oak, plain oak or ash make a satisfactory appearance and are comparatively easy to obtain. Pine may also be used, but it is not as good as the above mentioned woods as it is more liable to warp than the others. The quarter sawed oak excels them all.

Begin work on the sides first.

1. Plane a joint or working edge on each.

2. From the planed joint edge draw a line on each board  $\frac{1}{8}$  inch from one end with a try square and then plane down to line.

3. From the planed end measure the length, twelve inches, on each board and draw a line through this point with the try square from the joint edge. Plane to line. If too much remains to be planed, saw part of it away. Do not saw on the line but near it. If the worker saws on the line, the board

will be reduced to less than the required length, twelve inches.

4. From the joint edge measure the width,  $4\frac{3}{4}$  inches, and with a straight edge or large try square draw a line. Plane to line.

If this line is followed hereafter in squaring a board, our worker will invariably obtain satisfactory results.

The two sides have now been reduced to their correct lengths and widths. Always square up all pieces before attempting to lay out slants, angles or curves. Lay off and plane down slants on side pieces. Do not forget the openings for the back strips,  $\frac{1}{2}$  inch by  $1\frac{3}{4}$  inches.

The shelf may be made next. Reduce to length and width in the same manner as that of the side pieces, 22 inches by  $4\frac{3}{4}$  inches. The width of the shelf and sides coincide.

Let the back strips follow next;  $1\frac{3}{4} \times 23\frac{1}{4}$  inches.

Before assembling the parts, locate the

center of holes for dowel. Use a  $\frac{1}{4}$ -inch bit and bore a hole about 5-16 of an inch deep on the inner side of both side pieces. Fasten the side pieces to shelf with round head blued screws,  $1\frac{1}{4}$  inches in length.

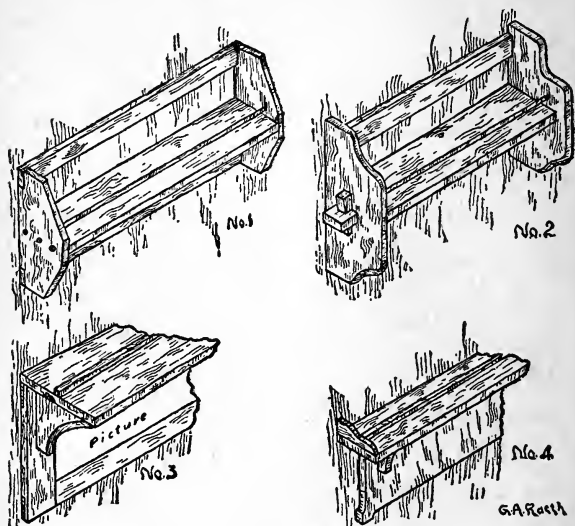
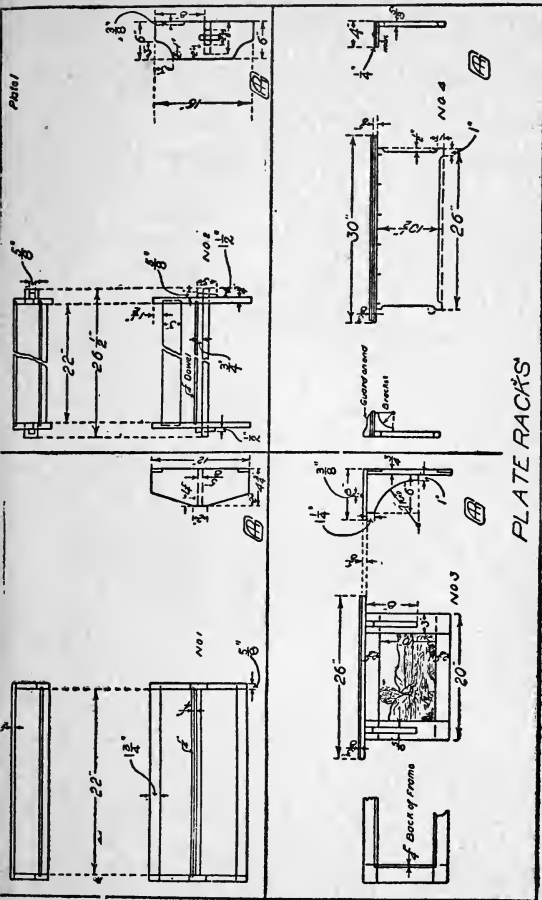


PLATE No. 1

Assemble back strips to side pieces with flat head bright screws, 1 inch in length.

In plate rack No. 2, the shelf is fastened



to the sides by means of pegs or keys. The rack requires the following pieces:

Two sides— $\frac{3}{4} \times 6\frac{1}{2} \times 16\frac{1}{2}$  inches.

One shelf— $\frac{3}{4} \times 5\frac{1}{2} \times 27$  inches.

One back— $\frac{3}{8} \times 3\frac{1}{2} \times 23\frac{1}{2}$  inches.

Two pegs— $\frac{5}{8} \times \frac{5}{8} \times 7$  inches.

One dowel— $\frac{1}{4}$  inch round by  $23\frac{1}{2}$  inches.

When ordering lumber at the mill, allow  $\frac{1}{2}$  inch for waste in length and width.

Reduce the sides to 16 inches long by 6 inches wide. Lay out 8 inches from the top, the projection opening for the shelf:  $\frac{3}{4} \times 2$  inches. First bore holes with a 10-16 bit before chiseling.

Draw the two large curves on the two front corners with a 3-inch radius. Then draw the smaller one-inch curves.

The shelf is  $26\frac{1}{2}$  inches in length and 5 inches in width when squared up. Lay out the ends as they are to project through the sides. The inside measurement of the length of the shelf and which touches against the inner side of both sides is 22



ches. The part of the shelf that passes through the sides on both ends is  $2\frac{1}{4} \times 2$  inches.

The opening for the pegs should be made next. Bore a hole before chiseling. Do not forget the taper. Use a  $\frac{1}{2}$ -inch bit.

Make the back board  $22\frac{3}{4} \times 3$  inches. Let the upper edge of the back be placed  $1\frac{1}{2}$  inches from the top of the sides. Next make the grooves on the inner side of both side pieces for the ends of the back  $\frac{3}{8}$  inch wide,  $\frac{3}{8}$  inch deep and 3 inches long.

The holes for the  $\frac{1}{4}$ -inch dowel must also be bored 2 inches from the front edge, in the same manner as explained in No. 1.

The pegs are  $\frac{5}{8} \times \frac{5}{8}$  inch at the top,  $2 \times \frac{5}{8}$  inch at the bottom and 3 inches in length. Always sandpaper and clean all the parts before assembling. The back can be fastened with glue, finishing nails or brads.

Plate rack No. 3 is pleasing in form. Besides being adaptable for the shelving of

plates, its lower portion is a practical picture frame. Instead of a  $\frac{3}{8}$ -inch strip on the top shelf, three narrow grooves are generally made for supporting plates.

Plate rack No. 3 requires the following pieces:

One shelf— $\frac{5}{8} \times 8\frac{1}{2} \times 26\frac{1}{2}$  inches.

Two rails— $\frac{3}{4} \times 3\frac{1}{2} \times 15$  inches.

Two rails— $\frac{3}{4} \times 2\frac{3}{4} \times 20\frac{1}{2}$  inches.

Two brackets— $\frac{5}{8} \times 6\frac{1}{2} \times 8\frac{1}{2}$  inches.

One strip— $\frac{3}{8} \times \frac{3}{8} \times 26\frac{1}{2}$  inches.

Make the shelf  $26 \times 8$  inches.

Make the two side rails  $\frac{3}{4} \times 3 \times 14\frac{1}{2}$  inches.

The other rails are  $\frac{3}{4} \times 2\frac{1}{4} \times 20$  inches.

The ends are lapped. The joints use end-lap. An end-lap joint is made in the same way as a cross-lap joint (meeting at the center) except that the joint is at the end of both pieces.

On the inner side and on the back groove is made,  $\frac{1}{4}$  inch wide and about  $\frac{1}{4}$  inch deep, to allow a plate of glass and

picture to be held in place. A mirror could be used in place of a picture.

The brackets when squared up are 6x8 inches. A 7-inch radius gives the curve. The brackets are fastened from the rear with flat head bright screws. The top is fastened in a like manner.

Plate rack No. 4 is supplied with six hooks for cups. The top shelf can also be used as a shelf for a clock or vase, etc., when the strip is removed. The sketch on the left shows how a piece in keeping with the rest of the rack can be placed on either end to guard against the rolling off of plates. The bracket can be made to support the shelf. The stock required for plate rack No. 4 is as follows:

One shelf— $\frac{5}{8}$ x $4\frac{1}{2}$ x $30\frac{1}{2}$  inches.

One board— $\frac{5}{8}$ x11x $26\frac{1}{2}$  inches.

One strip— $\frac{3}{8}$ x $\frac{3}{8}$ x $30\frac{1}{2}$  inches.

The bracket can be made  $3\frac{3}{4}$  inches wide and 4 inches long by  $\frac{1}{2}$  inch thick.

The worker must not lose sight of the

fact that in order to do good work his tools should be kept in excellent condition and in all cutting tools it is absolutely imperative that they be kept with a keen edge. Use the try square continually.

## MAGAZINE STANDS

### ARTICLE II

In making magazine stand No. 1, begin on the sides first, square to correct length and width, as explained in article I. First plane a joint edge; second, plane one end; third, plane to length; fourth, plane to width.

Do not remove the joint edges before the places for the shelves have been measured off and located. If the shelves are to be fastened with screws, a hole should be bored for each screw on the side pieces about 3-16 inch D, or  $\frac{1}{4}$  inch D, according to the size of the screw. If flat head screws are used, countersink the holes to allow the head of the screw to come down even with the surface of the side boards. Finishing nails or brads should be set and covered with putty and stained to match the wood. Fancy

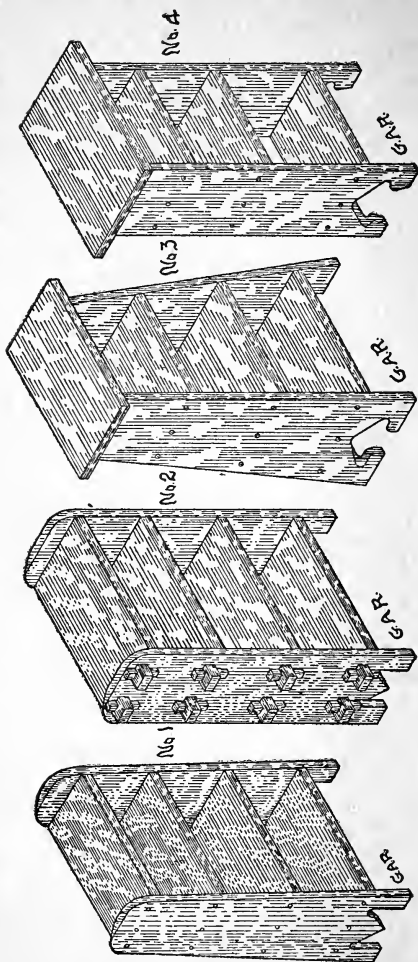


PLATE No. 2

headed nails or buttons are often used to cover the heads of finishing nails. Scrape, sandpaper and clean thoroughly all wood-

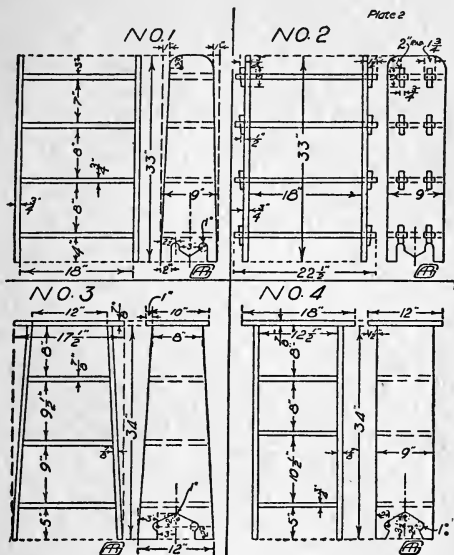


PLATE No. 2

work before assembling and staining or finishing.

Magazine Stand No. 1 requires the following pieces:

Two sides— $\frac{3}{4} \times 9\frac{1}{2} \times 33\frac{1}{2}$  inches.

Four shelves— $\frac{3}{4} \times 9\frac{1}{2} \times 18\frac{1}{2}$  inches.

After the sides have been squared up and the holes bored for the screws, the correct taper may be given to the board by marking off one inch from each corner on the top. The corners are then rounded 2 inch radius. The bottom designs of numbers 1 and 2 are alike.

Use a 16-16 bit for the 1-inch holes. Saw near the lines and work the rest down to the lines with a 1-inch chisel.

The four shelves are  $\frac{3}{4}$  inch in thickness and 18 inches in length. The width is made according to the taper of the sides.

The method of fastening magazine stand No. 2 is different from any other shown on this page. The shelves are held in place by means of pegs or keys.

Magazine stand No. 2 requires the following pieces:

Two sides— $\frac{3}{4} \times 9\frac{1}{2} \times 33\frac{1}{2}$  inches.

Four shelves— $\frac{3}{4} \times 9\frac{3}{4} \times 23$  inches.



(Note—The inside measurement for the length of the shelves is 18 inches as in No. 1).

Eight pegs— $\frac{3}{4} \times \frac{3}{4} \times 3\frac{1}{2}$  inches.

The sides are  $\frac{3}{4} \times 9 \times 33$  inches. The whole length for the shelves is  $22\frac{1}{2}$  inches. The width of each is 9 inches.

The pegs are  $\frac{3}{4} \times \frac{3}{4}$  inch at the top and  $\frac{3}{4} \times 1\frac{1}{2}$  inch at the bottom.

The projection of the shelf through the sides is  $2\frac{1}{4} \times 1\frac{3}{4}$  inches. The curve at the top of the sides is 2 inches radius.

For magazine stand No. 3 begin work on the sides first. Plane a joint edge on each and from this work the two ends as explained above. The ends will be square to the joint edge, but beveled to the working face. A bevel square will be needed for testing the beveled ends on top and bottom.

To set the bevel it will be necessary to make a drawing full size of the front view and place the bevel on the drawing, adjusting the blade and beam to the angle wanted.

When planing the side boards, first draw the center line before making the slant edges. Also draw lines for shelves. Lay off 12 inches on the bottom end. From the joint edges on the top end lay off 1 inch on either side, thus leaving 8 inches between.

As in No. 1, do not cut off the edges on the side pieces until lines have been measured off and located for the shelves.

The following pieces are required for Magazine Stand No. 3:

Two sides— $\frac{7}{8} \times 12\frac{1}{4} \times 34\frac{1}{2}$  inches.

One shelf— $\frac{7}{8} \times 12 \times 16\frac{1}{2}$  inches.

One shelf— $\frac{7}{8} \times 11 \times 15$  inches.

One shelf— $\frac{7}{8} \times 10 \times 14$  inches.

One top— $\frac{7}{8} \times 10\frac{1}{2} \times 18$  inches.

Magazine Stand No. 4 has a top, but omits the slant edges and beveled ends as shown in No. 3. This stand, on account of its simplicity and straight lines, is pleasing in appearance.

Magazine Stand No. 4 requires the following pieces:

Two sides— $\frac{7}{8} \times 9\frac{1}{2} \times 34\frac{1}{2}$  inches.

Three shelves— $\frac{3}{4} \times 9\frac{1}{2} \times 13$  inches.

One top— $\frac{3}{4}$  or  $\frac{7}{8} \times 12 \times 18\frac{1}{2}$  inches.

The sides when squared up are:  $9 \times 34$  inches; the shelves  $9 \times 12\frac{1}{2}$  inches; the top  $12 \times 18$  inches.

The magazine stands would look well if faced or covered with a thin leather of a color to harmonize with the wood. Ornamental tacks are used to fasten the leather in place. Roan skin or a thin leather can be used for facing the shelves.

## HINTS TO AMATEUR WOODWORKERS

1. Have smooth edges and ends at all times.

2. Observe the following system in reducing stock to its dimensions: First, select the working face; second, make the working edge (square with the working

face); third, make the working end (square with the working face and working edge); fourth, reduce to a length (square with the working face and working edge); fifth, reduce to a width (square with the working face and the two ends). In this case thickness is not considered.

3. When measuring with a two-foot rule, tip it over on its edge to bring the lines of graduation down on the work.

4. Saw with one hand. Use the full length of the saw and do not force nor jerk it.

5. Do not place boards of large dimensions in vise when sawing. Do not place boards too high in vise when sawing or planing.

## **TABOURETS**

### **ARTICLE III**

The constructive designs of the tabourets, as shown on plate 3, are so plain in nature that the reader and worker will find little difficulty in constructing same.

In richness of grain, quarter sawed white oak is the most satisfactory of all woods in furniture making. A mellow softness and luster can be given to the grain by carefully and properly applying harmonious stains and a wax finish.

The manufacturers of stains, wax and finishes, as a rule, give a detailed description of the correct application and use of each product, so that little trouble will be experienced in obtaining pleasing results.

### **Golden Oak Finish**

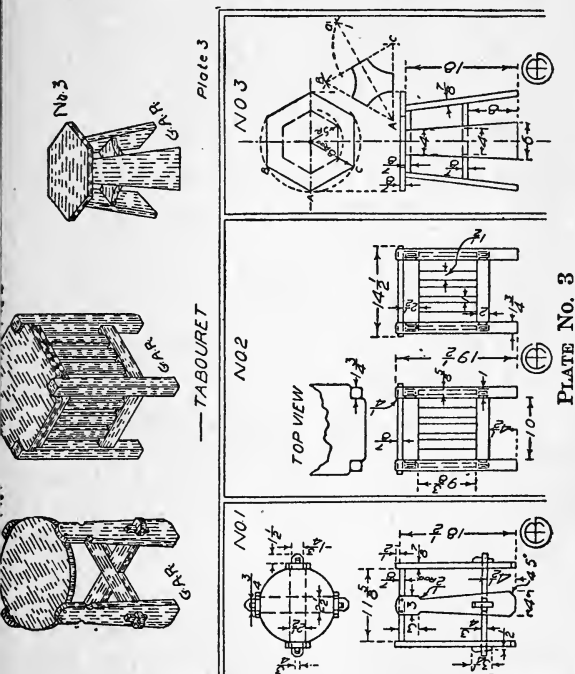
This is one of the most popular styles, and bids fair to become permanent. There

is no universally accepted standard of color for it and it has quite a wide latitude as to shade, varying according to locality and individual taste.

To obtain an egg shell gloss, proceed as follows: First, one coat of golden oak water stain; second, allow time to dry, then sandpaper lightly with fine sandpaper (this is done to bring out the high lights); third, apply a second coat of stain diluted about one-half with water, which will throw the grain into still higher relief, and so produce the effect of contrast that constitutes one of the features of golden oak.

The sandpaper to be used, as spoken above, should be No. 00 and wound around a block of wood. For the fourth step follow the second coat of stain with a light coat of thin shellac, sandpaper lightly with fine sandpaper. Fifth, when the shellac has been sandpapered, a colored filler to match the stain is then applied to prevent discoloration. Sixth, a coat of orange shellac is

to follow the filler. Seventh, sandpaper lightly. Eighth, apply two or three coats of varnish. Ninth, rub first coats with hair-



cloth or curled hair, and the last coat with pulverized pumice stone and crude oil or raw linseed oil.

If a dull finish is desired, specify that the last coat be rubbed with pulverized pumice stone and water instead of oil.

Tabouret No. 1 is typical of the style of furniture construction bought upon the market at this age. The top is fastened to the four legs with dowels or round head blued screws; the braces by means of pegs or keys.

Order the following pieces for tabouret No. 1:

One top— $\frac{7}{8} \times 12 \times 12$  inches.

Four legs— $\frac{7}{8} \times 4\frac{1}{2} \times 19\frac{1}{2}$  inches.

Two braces— $\frac{3}{4} \times 3 \times 16\frac{3}{4}$  inches.

Four pegs— $\frac{3}{4} \times \frac{3}{4} \times 3\frac{3}{4}$  inches.

The diameter (D) for the circular top is  $11\frac{5}{8}$  inches. The top, however, would look better if made about 18 inches D.

The total length for the braces is  $16\frac{1}{8}$  inches. The width is  $2\frac{1}{2}$  inches. The inside measurement for the braces is  $11\frac{5}{8}$  inches; the part that projects through the sides is  $2\frac{1}{4}$  inches on each end and  $1\frac{3}{4}$



inches in width. The legs when squared up are  $\frac{7}{8} \times 4 \times 19$  inches.

Locate and square off the lines for the braces before tapering the joint edges. The legs are 3 inches at the top and rounded. Note carefully the other measurements on the side pieces. Each peg is  $\frac{3}{4}$  inch square at the top and  $\frac{3}{4} \times \frac{1}{2}$  inch at the bottom,  $3\frac{1}{4}$  inches in length. The tabouret, if made of bass or holly wood, can be designed and burned with a pyrography needle. The same can be said of tabouret No. 3.

To lovers of the furniture with straight lines and simplicity, tabouret No. 2 will be most welcome. The top is to be fastened to cleats which are first fastened to the upper rails and flush with the underside of the top.

Order the following pieces at the mill for tabouret No. 2:

Four posts— $1\frac{3}{4} \times 1\frac{3}{4} \times 20$  inches.

One top— $\frac{7}{8} \times 15 \times 15$  inches

Four rails— $1 \times 3 \times 12$  inches, over all.

Four rails— $1 \times 2\frac{1}{2} \times 12$  inches, over all.

Twelve slats— $\frac{5}{8} \times 2 \times 11\frac{1}{2}$  inches over all.

1. Make the posts to size first:  $1\frac{3}{4} \times 1\frac{3}{4} \times 19\frac{1}{2}$  inches.

2. Reduce the top rails to size:  $1 \times 2\frac{1}{2} \times 11\frac{1}{2}$  inches, over all; between tenons, 10 inches.

3. The lower rails are to be:  $1 \times 2 \times 11\frac{1}{2}$  inches, over all; between tenons, 10 inches.

4. The twelve slats measure:  $\frac{5}{8} \times 1\frac{1}{2} \times 11$  inches, over all; between tenons,  $9\frac{3}{8}$  inches.

5. The top when completed measures:  $\frac{7}{8} \times 14\frac{1}{2} \times 14\frac{1}{2}$  inches. Do not omit the notches on each corner of the top.

The upper and lower rails, together with their slats, are to be assembled before fitting rails into their respective places on the corner posts.

The joints used are the mortise and tenon.

Round the corners of the posts on their upper ends as shown in the drawings.

The simplest in form is the tabouret

shown in drawing No. 3. In order to obtain the correct slants of its different parts, however, it is necessary to make a full size drawing of the tabouret and transfer the angles obtained in this manner to the work with a bevel square.

The brace, which is placed eight inches from the bottom, is made from a triangular piece of wood, A, B and C, as the drawing shows.

To bisect the line B C with the compass, take a radius equal to a little more than  $\frac{1}{2}$  B C. With this strike off arcs from B and C; the point of intersection is "a." A line drawn from A to "a" will divide line B C into two equal portions. The same method can be used in bisecting any other side or line of the equilateral-triangle.

To construct the hexagonal top first describe a circle on the board with an eight-inch radius, thus giving a circle whose diameter (D) is 16 inches.

To obtain the six sides, place the com-

pass with its 8-inch radius (R) on some point in the circumference of the circle. For example, point A as shown in the drawing.

From the point A strike off arcs through the circumference at B and C. From either points, B and C, continue to strike off arcs on the circle until six have been made. The points when connected by straight lines form the hexagon. In the same manner the board brace beneath the top is obtained with a five-inch radius.

Order the following pieces for tabouret No. 3:

One top— $\frac{7}{8} \times 16\frac{1}{2} \times 16\frac{1}{2}$  inches.

Four legs— $\frac{7}{8} \times 6\frac{1}{2} \times 19$  inches.

One board brace— $\frac{7}{8} \times 10\frac{1}{2} \times 10\frac{1}{2}$  inches.

One triangular board brace— $\frac{7}{8} \times 13 \times 13$  inches.

1. Construct the hexagonal top as explained above,  $\frac{7}{8} \times 16 \times 16$ ; 8 inches is the radius to be used.

2. Square up the legs  $\frac{7}{8}$  inch thick, 6 inches wide and 18 inches and a fraction of

an inch long. The length depends upon the slant given to the legs.

3. Construct a triangle  $\frac{7}{8}$  of an inch thick and  $12\frac{1}{2}$  inches and a fraction of an in on all its sides. Here, too, the large dimension depends upon the slant given to the legs.

4. The brace beneath the top is to be  $\frac{7}{8}$  of an inch thick and constructed as explained above with a 5-inch radius.

5. The legs at the upper ends are 4 inches wide.

6. The lower board brace is fitted onto the inner side of the legs with dowel pins. Round head blued screws can also be used in fastening the above pieces.

### **Five Hints to Amateurs**

1. Do not split boards with a chisel. Use a rip saw.

2. When reducing stock to dimensions and the work is to have a finished edge or end, do not saw on the line but near it and

then work to line with a plane, or whatever tool that may be used.

3. The parts of a plane are: The stock, the face, the toe, the heel, the knob, the handle, (opening) the mouth, (entrance) the throat, the plane iron, the cap, the clamp, the lever and the thumb screw.

4. Learn the names and uses of all the simple tools of carpentry.

5. To avoid the splitting of the corners on the end of a board, cut away one corner and plane across from the other side; or, plane seven-eighths across the whole end from both edges.

## SEWING TABLE, CELLARETTE AND CARD TABLE

### ARTICLE IV

The sewing table on plate 4 is of the kind that can be undertaken by persons whose skill in handling the tools of carpentry is equivalent to that attained by high school boys. As shown in the drawing there are no drawers, but these might easily be added if thought desirable, i. e., a small draw on either end or a larger one on one side.

Bird's-eye maple is appropriate material to use for a table of this kind. The top may be made in three strips, each 8 inches wide and doweled. A cleat (a strip about 3 inches wide) or two should be screwed underneath the table top to keep it from warping.

With the exception of some round tables, a number of manufacturers use nothing but "built up" ply tops. Each top is made up

of four or five thicknesses of wood with the grain of each layer running in a different direction. Around each edge of the top is a band of the kind of wood used about three inches wide, inserted between the layers. These tops will never warp and get out of shape.

The parts of our sewing table are all fastened in place by means of "doweled" joints. For light structures as the above, the dowel joints will prove satisfactory for assembling parts.

Whenever a joint is to be made, that from its nature cannot be satisfactorily held together with patent fasteners or screws, the mortise and tenon joint should be used. The mortise and tenon joint referred to is the "blind" mortise and tenon, and is similar to the simple mortise and tenon. The simple, "common" or "stub" mortise and tenon is made by cutting only two sides of the tenon beam. (The tenon is the part that fits snugly within the mortise). It was



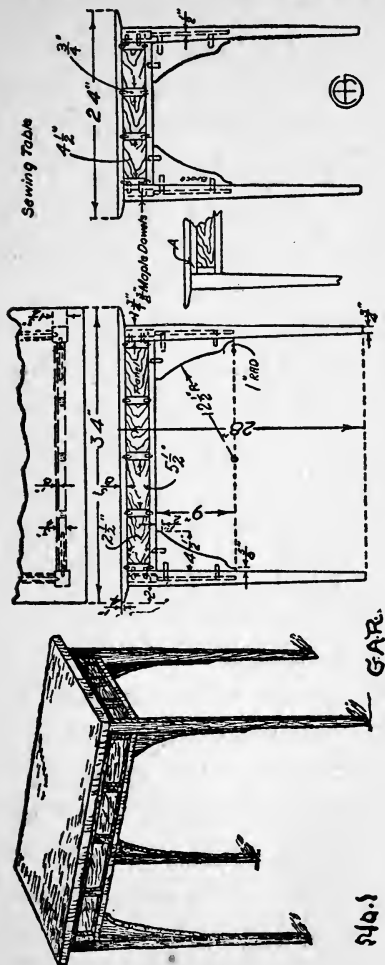


PLATE No. 4

formerly used for lower ends of studding or other pieces to prevent lateral motion. The "blind" mortise and tenon joint does not extend through the mortised piece, and the cheeks of the tenon may be cut on two or four sides.

Bear the above statements in mind for succeeding plates on tables.

The parts required for the sewing table are:

One top— $\frac{5}{8} \times 24\frac{1}{2} \times 34\frac{1}{2}$  inches.

Two side rails— $\frac{3}{4} \times \frac{3}{4} \times 27$  inches.

Two end rails— $\frac{3}{4} \times \frac{3}{4} \times 17$  inches.

Ten side posts— $\frac{3}{4} \times \frac{3}{4} \times 3$  inches.

Eight end posts— $\frac{3}{4} \times \frac{3}{4} \times 3$  inches.

Four legs— $2 \times 2 \times 28$  inches.

Eight braces— $\frac{1}{2} \times 5 \times 9\frac{1}{2}$  inches.

Two side panels— $\frac{1}{8} \times 3 \times 27$  inches.

Two end panels— $\frac{1}{8} \times 3 \times 27$  inches.

For posts and rails use  $\frac{3}{8}$ -inch dowels.

For the  $\frac{1}{2}$ -inch braces,  $\frac{1}{4}$ -inch dowels.

The top when completed is  $\frac{5}{8}$  inch thick, 24 inches wide and 34 inches long. Make

the long rails  $\frac{3}{4} \times \frac{3}{4}$  inch square and  $26\frac{1}{2}$  inches long.

Make the side or end rails  $\frac{3}{4} \times \frac{3}{4}$  inch square and  $16\frac{1}{2}$  inches long.

Note that the legs are  $1\frac{3}{4}$  inches square to the under side of the rails from which place they taper down to  $\frac{3}{4}$ -inch square at the bottom.

Each post is  $\frac{3}{4} \times \frac{3}{4} \times 2\frac{1}{2}$  inches. They are fastened to the rails and underside of the table with dowels.

The eight braces when squared up and before making any curves, etc., are  $\frac{1}{2} \times 4\frac{1}{2} \times 9$  inches.

The two side panel pieces are  $\frac{1}{8} \times 2\frac{1}{2} \times 26\frac{1}{2}$  inches. The two end panels are  $\frac{1}{8} \times 2\frac{1}{2} \times 16\frac{1}{2}$  inches. The panels are fastened on the inner side of the rails and posts.

First make framework of posts and rails. Fasten legs to these. When the top is completed, locate and bore the holes on the under side for the dowels on the upper end of the posts. The legs should be fastened

to the under side of the top by means of iron angles.

Instead of a lower rail, a top rail may also be added as shown in sketch "a."

Some persons will find the making of the rails and posts a tedious task. For those workers the writer advises the making of solid rails as a substitute for the framework and its panel.

No. 2, a cellarette, is coming into favor in a great many homes today. The model as shown on this plate is a simple construction with its straight sides. Four sides serve as doors and the other four as legs. The edges of these pieces are at right angles or 90 degrees to the faces of the boards.

The cellarette requires the following pieces:

One top— $\frac{3}{4} \times 24\frac{1}{2}$  inches D or wider, round.

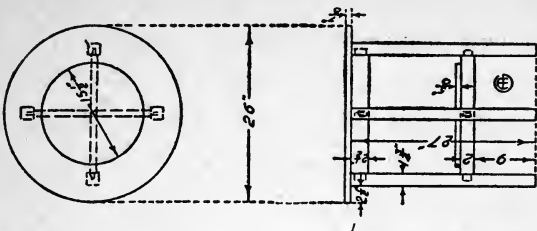
Four legs— $\frac{3}{4} \times 5\frac{1}{2} \times 28\frac{1}{2}$  inches.

Four doors— $\frac{3}{4} \times 5\frac{1}{2} \times 16\frac{1}{2}$  inches.

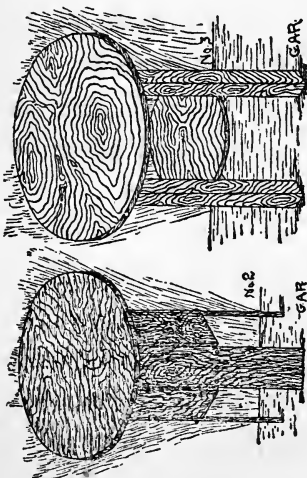
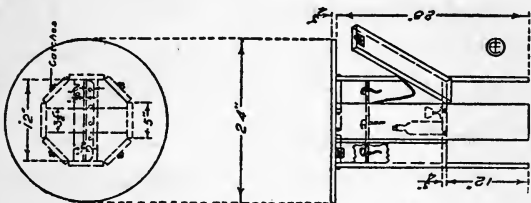
Two braces— $\frac{3}{4} \times 4 \times 12\frac{1}{2}$  inches.

Plate 4

Card Table



Cellarette



One shelf— $\frac{3}{4} \times 12\frac{1}{2} \times 12\frac{1}{2}$  inches

One centerpiece— $\frac{3}{8} \times 12\frac{1}{2} \times 16\frac{1}{2}$  inches.

One pipe rack— $\frac{3}{8} \times 2\frac{1}{2} \times 12\frac{1}{2}$  inches.

Make the cellarette of ash, plain or quarter-sawed oak.

The circular top is  $\frac{3}{4} \times 24$  inches in diameter.

The four legs are  $\frac{3}{4} \times 5 \times 28$  inches.

The four doors are  $\frac{3}{4} \times 5 \times 16$  inches.

The braces, which are fastened beneath the top, are  $\frac{3}{4} \times 3\frac{1}{2} \times 12$  inches, and are in construction like those of the braces of tabouret No. 1 in plate 3.

The lower board is octagonal in form, serves as a shelf and brace; when squared up is  $\frac{3}{4} \times 12 \times 12$  inches.

The legs are fastened to the braces and the shelf with round head blued screws,  $1\frac{1}{2}$  inches in length.

Besides catches to hold the doors in place as shown in the drawing, other devices can be purchased on the market.

First—Screw the braces to the under side of the top.

Second—Screw the legs to the shelf, 12 inches from the bottom.

Third—Make the center piece.

Fourth—Nail piece for pipes,  $\frac{3}{8} \times 2 \times 12$  inches to centerpiece about 5 inches from the top.

Fifth—Fasten centerpiece with pipe rack inside of legs and touching on the upper side of the shelf.

Sixth—Screw framework of legs, shelf and centerpiece to the four ends of the braces.

Seventh—Fasten hinges on lower ends of pieces for doors.

Eighth—Screw catches in place.

Ninth—Screw the hinged ends of the door pieces to the underside of shelf in their respective places. Small chains may be provided to support the doors when opened.

The next article No. 3 is serviceable as a card or center table. The top of the table

may be faced with leather. Table No. 3 requires the following pieces:

One top— $\frac{7}{8} \times 26\frac{1}{2}$  inches D, round.

Four legs— $1\frac{3}{4} \times 1\frac{3}{4} \times 27\frac{1}{2}$  inches.

Two braces (lower)— $\frac{3}{4} \times 2\frac{1}{2} \times 19\frac{1}{2}$  inches.

Two braces (upper)— $\frac{3}{4} \times 3 \times 19\frac{1}{2}$  inches.

One shelf— $\frac{5}{8} \times 16$  inches D, round.

When finished the top is  $\frac{7}{8} \times 26$  inches D, or larger round. The legs are  $1\frac{3}{4}$ -inch square by 27 inches. The lower braces are  $\frac{3}{4} \times 2 \times 19$  inches. The upper braces are  $\frac{3}{4} \times 2\frac{1}{2} \times 19$  inches. The shelf is  $\frac{5}{8} \times 15\frac{1}{2}$  inches D, round.

The joints to be used in fastening the braces to the legs are the blind mortise and tenon joints.

Note—The method of fastening with pegs, as used in preceding articles is sometimes called a keyed mortise and tenon. It is one in which the tenon protrudes through the mortise far enough to receive a removable key or peg and thus be drawn up tight to the mortised piece. It is often



used by furniture manufacturers in knock-down bookcases, tables, etc.

Note—The perspective of the sewing table shows the top with square edges and ends. There is an upper and lower rail. There are no braces on the ends and the same are different in form than those shown in the working drawing. As a whole, the sketch gives a definite view as to how the sewing table will appear when completed.

## CHAIRS

### ARTICLE V

The chairs shown on plate 5 are of simple construction. The parts of the first chair are practically all fastened in place by means of round head blued screws, and those of the second by plain mortise and tenon joints.

The use of glue is not necessary with chair No. 1. The back is made of one solid piece; and similarly, the two side legs instead of four as used in the ordinary framed up construction. As a whole, the first chair has been sufficiently simplified to suit amateur ability.

Chair No. 1 requires the following:

One seat— $\frac{3}{4} \times 18\frac{1}{2} \times 18\frac{1}{2}$  inches.

One back— $\frac{7}{8} \times 18\frac{1}{2} \times 26$  inches.

Two rails— $\frac{7}{8} \times 8\frac{1}{2} \times 17$  inches.

Two legs— $\frac{3}{4}$  or  $\frac{7}{8} \times 17\frac{1}{2}$  inches (height) by  $18\frac{1}{2}$  inches (width).

Three cleats— $\frac{7}{8} \times \frac{7}{8} \times 18$  inches.

As explained in Article 2, a bevel square should be used in obtaining the beveled edges and ends. It is necessary to make a full drawing in order to transfer the correct angles to all parts.

Proceed in the following manner in making chair No. 1:

1. Square up the tow legs,  $\frac{3}{4}$  or  $\frac{7}{8} \times 17$  inches (length) by 18 inches (width).
2. Bevel the ends to angle desired.
3. Make bottom design on legs.
4. Slant the joint edges. Remove an inch from either side at the top end, leaving sixteen inches for the width at the top.
5. Round the lower corners, one inch radius.
6. Make rear space on legs for back piece according to slant, thickness, seven-eighths of an inch, and depth four inches.
7. Square up front and back rails,  $\frac{7}{8} \times 8$  inches. The length must fit in accordance with the inclination of the legs. Take the

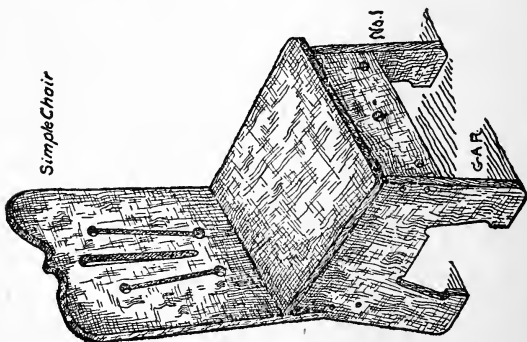
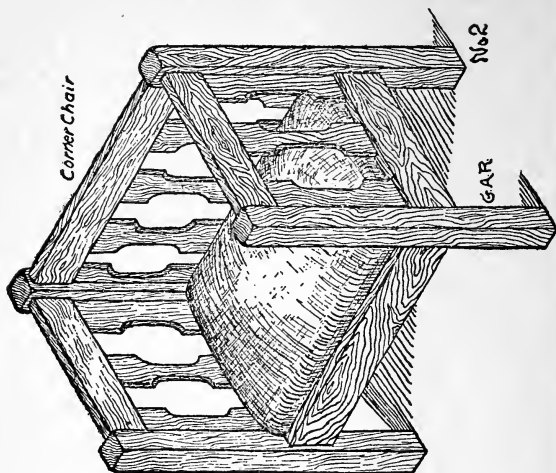
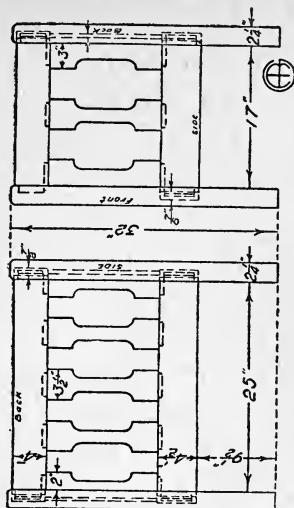


Plate 5

Corner Chair



Simple Chair

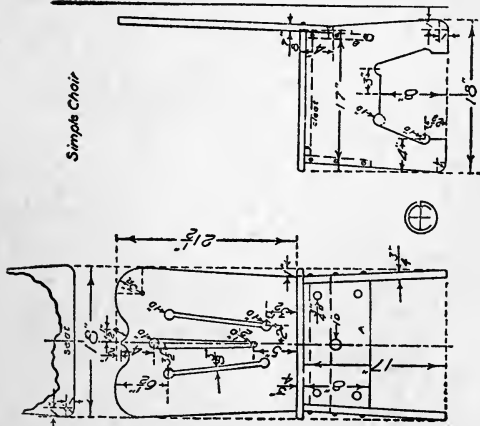


PLATE No. 5

same from the full size drawing. Only the front rail has a design as shown in the drawing.

8. Square up the seat  $\frac{3}{4} \times 18$  inches (width)  $\times 17$  inches (length).

9. Give to it the correct slant on end.

10. Remove the joint edges. The width at the rear end is 16 inches.

11. Round the front corners of seat, one-inch radius.

12. Square up the back  $\frac{7}{8} \times 18 \times 25\frac{1}{2}$  inches.

13. Draw a center line.

14. Make inner design on back.

15. Bevel lower end.

16. Taper the edges downward.

17. Give curves to upper end of back.

18. Fasten legs to rails and plane latter flush on upper edges.

19. Make three cleats seven-eighths of an inch square and screw to inner sides of legs and front rail, flush to the under side of seat.

20. Screw seat to cleats.

21. Screw back to seat and back rail.

Note—The back of the chair may be inclined two inches.

Clean thoroughly before assembling.

The chair if made of holly or bass wood can be pyrographed.

A chair assuring comfort is that shown in drawing No. 2. The proportions of the corner chair are comfortable and make rest inviting. Its massive effect and straight lines lend to it an air of distinction and dignity.

The corner chair requires the following pieces:

Four legs— $2\frac{1}{4} \times 2\frac{1}{4} \times 32\frac{1}{2}$  inches.

One front rail— $\frac{7}{8} \times 5 \times 27$  inches.

One lower back rail— $\frac{7}{8} \times 5 \times 27$  inches.

Two lower side rails— $\frac{7}{8} \times 5 \times 19$  inches.

One upper back rail— $\frac{7}{8} \times 4\frac{1}{2} \times 27$  inches.

Two upper side rails— $\frac{7}{8} \times 4\frac{1}{2} \times 19$  inches.

Three slats for back— $\frac{1}{2} \times 4 \times 15\frac{1}{2}$  inches.

Two slats for back— $\frac{1}{2} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

Two slats for sides— $\frac{1}{2} \times 4 \times 15\frac{1}{2}$  inches.

Four slats for sides— $\frac{1}{2} \times 3\frac{1}{2} \times 15\frac{1}{2}$  inches.

1. The legs when squared up, are  $2\frac{1}{4} \times 2\frac{1}{4} \times 32$  inches rounded at the top.

2. Make the front and the two back rails twenty-six and one-half inches in length over all. The measurement inside the tenons is twenty-five inches; the thickness is  $\frac{7}{8}$  of an inch. The width for the front and lower back rails is four and one-half inches when completed.

3. Make all the rails eighteen and one-half inches in length, over all. The thickness for all is seven-eighths of an inch. The width for the two lower side rails is four and one-half inches. The width of the two upper side rails is four inches. The measurement inside of the tenons on the side rails is seventeen inches.

4. The width of the upper back rail is four inches.

5. Three slats on the back are  $\frac{1}{2} \times 3\frac{1}{2} \times 15$  inches over all. The length inside of



the tenons is thirteen and one-half inches.

6. The other two slats on the back are  $\frac{1}{2} \times 2 \times 15$  inches.

Note—The inside length is the same on all slats; thirteen and one-half inches.

7. The one slat on either side is  $\frac{1}{2} \times 3\frac{1}{2} \times 15$  inches over all.

8. The two outside slats on either side are  $\frac{1}{2} \times 3 \times 15$  inches over all.

9. The curves on all the slats are made three inches from the end and one inch radius.

10. The lower rails are to be placed nine and one-half inches from the floor. The upper rails are placed one-half inch from the top of the legs.

11. The parts are glued in place. Use clamps to hold the parts until the glue is dry. Clean thoroughly.

12. Stain and wax.

The cushion for the corner chair can be made separately and fitted within the framework of the lower rails.

In case you have forgotten how to square up a board return to Articles 1 and 2.

### **Five Hints to Amateurs**

1. Planes should be placed upon the bench so as not to dull the plane iron. Tip plane over on its side after using.

2. Do not test the work from an unplaned or uneven face or end. Follow steps in planing a board as outlined in Articles 1 and 2.

3. Do not use too many nails on the work. This will split the board and does not add to its appearance.

4. (a) Neither should nails on a small piece of wood be placed in one straight line for the same reason as stated above.

(b) Whenever possible use brads instead of nails.

5. Sandpapering should not be done until all tool processes have been completed. The little grains of sand left in fibers of the

wood will dull the cutting edges of the tools used.

“Man is a tool using animal. He can use tools, can devise tools; with these, granite mountains melt into light dust before him; he kneads iron as if it were soft paste; seas are his smooth highways, winds and fire his unwearying steeds. Nowhere do you find him without tools; without tools he is nothing, with tools he is all.”—Carlyle.

## PLANT STANDS

### ARTICLE VI

Plate 6 shows working drawings of three plant stands, solidly built and based on good lines. The materials best adapted for most of the articles, as shown on this page, are oak, ash, chestnut and white pine.

Plant stand No. 1 needs the following pieces:

Four legs— $1\frac{3}{4} \times 1\frac{3}{4} \times 30\frac{1}{2}$  inches.

Four rails— $\frac{3}{4} \times 3\frac{1}{2} \times 16\frac{1}{2}$  inches.

Two shelves— $\frac{3}{4} \times 16\frac{1}{2} \times 16\frac{1}{2}$  inches.

Six slats— $\frac{3}{8} \times 3 \times 20\frac{1}{4}$  inches.

Proceed in the following manner to construct the above plant stand:

1. Square up the four legs,  $1\frac{3}{4} \times 1\frac{3}{4} \times 30$  inches.

2. Make mortises on legs for rails, 1 inch from the top,  $1\frac{1}{2}$  inches long,  $\frac{3}{8}$  or  $\frac{1}{2}$  inch wide and  $\frac{3}{4}$  of an inch deep or more.

3. Make the lower mortises on the legs,

5 $\frac{1}{4}$  inches from the bottom, 2 $\frac{1}{4}$  inches long,  $\frac{3}{4}$  of an inch deep and  $\frac{3}{8}$  of an inch wide.

4. Make the four rails each  $\frac{3}{4} \times 3 \times 16\frac{1}{2}$  inches (over all).

5. Make the tenons on the rails to fit the mortises in the legs. The measurement inside the tenons on the rails is 15 inches.

6. Make the slants on the upper two rails.

7. Make the six slats each  $\frac{3}{8} \times 2\frac{1}{2} \times 19\frac{3}{4}$  inches (over all).

8. Make mortises on the rails to receive the slats:  $\frac{1}{4}$  inch wide,  $\frac{3}{8}$  inch or more deep and 2 inches long.

9. Make the tenons on the slats to fit in mortises on rails. The measurement inside the tenons on the slats is 19 inches, thus leaving  $\frac{3}{8}$  of an inch on either end for the tenons.

10. Glue slats in rails and clamp until dry.

11. Glue legs onto rails and clamp until dry.

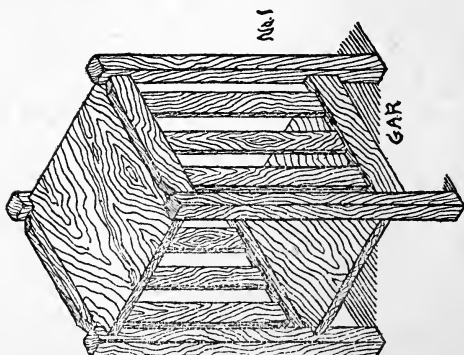
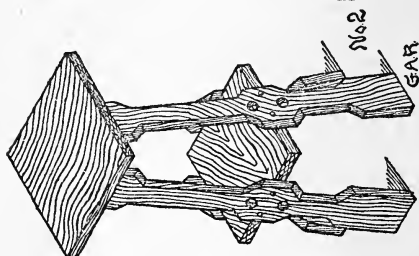
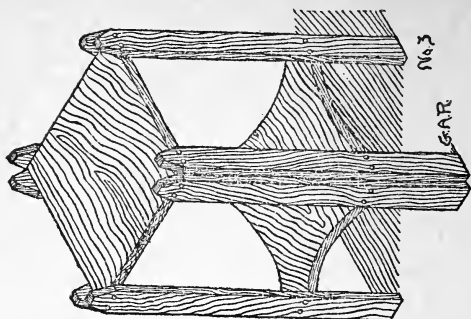


Plate 6

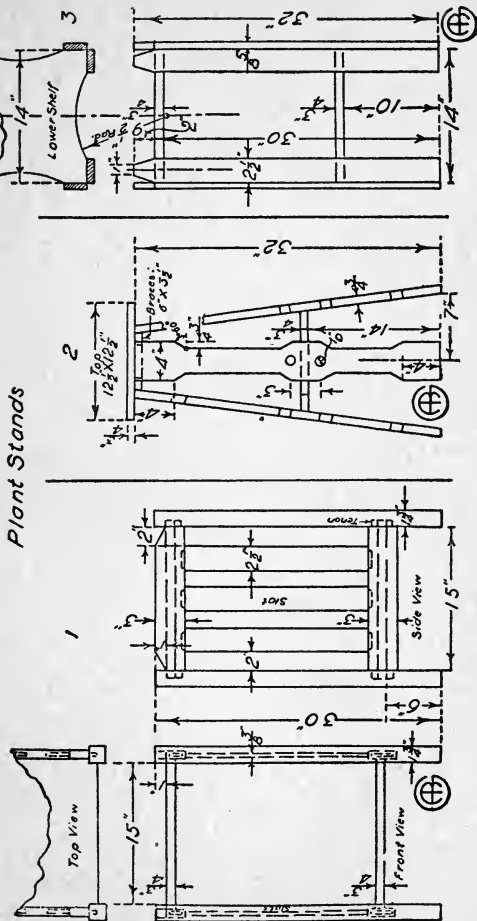


PLATE No. 6

12. Make the upper and lower shelves:  $\frac{3}{4}$ x16x16 inches.

13. Adjust the corners of shelves to fit at legs and rails. See drawing and sketch.

14. Fasten shelves in place by means of dowel pins or round blued or brass screws. Stand No. 1 will also serve well as a tabouret.

The only difficulty in constructing plant stand No. 2 will be met in making the beveled ends. In order to obtain a definite angle on each, make a full size drawing and place the bevel square on the same. The set angle is then transferred to the woodwork.

The following pieces are required for plant stand No. 2:

Four legs— $\frac{3}{4}$ x4 $\frac{1}{2}$ x32 $\frac{1}{2}$  inches.

One top— $\frac{3}{4}$ x13x13 inches.

One shelf— $\frac{3}{4}$ x12x12 inches.

Two braces— $\frac{3}{4}$ x4x6 $\frac{1}{2}$  inches.

Proceed as follows in making the above stand No. 2:



1. Square up the four legs:  $\frac{3}{4} \times 4 \times 32$  inches.
2. Draw a center line on each.
3. Bevel the ends as explained above from drawing.
4. Make the designs on joint edges. (For the inch holes use a 16-16 bit. Bore on one side until the spur of the bit comes through. Turn the board about and finish boring from the inner side, or bore on other side).
5. Square the top:  $\frac{3}{4} \times 12\frac{1}{2} \times 12\frac{1}{2}$  inches.
6. Square up the braces:  $\frac{3}{4} \times 3\frac{1}{2} \times 6$  inches.
7. Make the beveled ends.
8. Make cross lap joints on braces.
9. Figure out width and length of shelf. Both length and width should be the same. Locate place for shelf.
10. Assemble all parts with screws. Clean all parts thoroughly before fastening. Stand No. 2 can be used equally as well as a pedestal.

An article simple in construction is shown in figure 3. There is no jointing to do and with the exception of the shelf, all the parts require straight planing only.

A third shelf can be placed between the top and lower, if thought desirable.

Plant stand No. 3 requires the following pieces:

Eight legs— $\frac{5}{8} \times 3 \times 32\frac{1}{2}$  inches.

Two shelves— $\frac{3}{4} \times 14\frac{1}{2} \times 14\frac{1}{2}$  inches.

When squared up the legs are  $\frac{5}{8} \times 2\frac{1}{2} \times 32$  inches; the shelves  $\frac{3}{4} \times 14 \times 14$  inches.

Do not neglect to make the one inch points on the legs and the compass curves on the lower shelf of  $9\frac{1}{2}$  radius.

The upper shelf is placed two inches from the top of the legs and the lower shelf is fastened 10 inches from the bottom ends of the legs.

### Five Hints to Amateurs

1. Hold the plane firm on the work and slide it over the whole length with long and

even strokes. Stand firm on both feet, with the left foot extended ahead of the right.

2. Sandpaper should not be used across the grain, especially immediately before finishing.

3. Whenever the work is to have a finished edge or end, another tool should be used instead of a file or rasp.

4. (a) When boring the work should be placed in the vise and not upon the floor.

4. (b) Bore holes until the spur of the bit shows; withdraw the bit and bore the rest from the other side; or turn the work about and bore from the inside.

5. When working do not sit down.

“Prodding is a weariness to prodder and prodee. The man of initiative needs no prod.”

## HALL TREES OR COSTUMERS

### ARTICLE VII

How often has mamma told Johnny not to throw his coat and cap upon the chair when he enters the house? Now, mothers who are troubled in this way should induce the fond fathers to construct one of the hall trees as shown in plate 7. These are not only good for the boys to hang their wraps on but also for the rest of the family.

The first hall tree requires the following pieces:

One center pole— $1\frac{1}{2} \times 1\frac{1}{2} \times 66\frac{1}{2}$  inches.

Two cross pieces— $2\frac{1}{2} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

Four brackets— $1 \times 6 \times 10\frac{1}{2}$  inches.

Note: If a measurement for a board can be had at the mill as the drawing may call for, the mill order will specify the same accordingly; i. e., the pole can be received at the mill planed on four sides, one and one-half inches square. If not mill planed, al-

ways allow about one-half inch on length and thickness for waste.

1. The pole when finished is one and one-half inches square, by sixty-six inches in length.

2. The cross lap pieces, that serve as rests, when finished are two inches thick, two inches wide and fifteen inches in length.

3. Make a cross lap joint at their centers: two inches wide and one inch deep.

4. Make the one inch chamfers on the ends of cross pieces.

5. The four brackets when finished are 1 inch thick,  $5\frac{1}{2}$  inches wide and 10 inches in length. First, square up the boards before attempting the curves.

6. Locate and bore the holes for the dowels on pole and brackets.

7. The brackets can also be fastened to the rests by means of dowels.

8. A dowel pin can be placed in the lower end of the pole and slipped through a

hole, the size of the diameter of dowel, in the center of both cross pieces.

For costumer No. 2 order the following pieces from the mill:

Two vertical poles— $1 \times 2\frac{1}{2} \times 66\frac{1}{2}$  inches.

One top rail— $\frac{3}{4} \times 3\frac{1}{2} \times 17$  inches.

One second rail— $\frac{3}{4} \times 2 \times 17$  inches.

One third rail— $\frac{3}{4} \times 2 \times 17$  inches.

One board— $1 \times 8\frac{1}{2} \times 17$  inches.

Four brackets, each— $1 \times 8 \times 10\frac{1}{2}$  inches.

Two rests (a)— $2 \times 2\frac{1}{2} \times 18\frac{1}{2}$  inches.

Three slats— $\frac{5}{8} \times 3\frac{1}{2} \times 43$  inches.

The brackets in design are like those shown in figure No. 1.

1. Make the long vertical poles  $1 \times 2 \times 66$  inches.

2. Make the top slants on upper ends.

3. Square up the top rail:  $\frac{3}{4}$  in. thick x 3 inches wide,  $16\frac{3}{4}$  inches long over all.

4. On the ends make the tenons:  $\frac{3}{8}$  inches or longer,  $\frac{3}{8}$  inches thick and about two inches wide.

5. Square up the second rail:  $\frac{3}{4}$  inch

thick,  $1\frac{1}{2}$  inches wide, and  $16\frac{3}{4}$  inches long over all.

6. On the ends make the tenons  $\frac{3}{8}$  inch or longer,  $\frac{3}{8}$  inch thick and about  $\frac{7}{8}$  inch wide.

7. Square up the third rail:  $\frac{3}{4}$  inch thick,  $1\frac{1}{2}$  inches wide, and  $16\frac{3}{4}$  inches over all in length.

8. Make the tenons on the ends:  $\frac{3}{8}$  inch long,  $\frac{3}{8}$  inch thick and about  $\frac{7}{8}$  inch wide.

9. Make the mortises on the inside of the poles to receive the tenons on the three rails respectively.

10. Square up the three slats:  $\frac{5}{8}$  inch thick, 3 inches wide, and  $42\frac{3}{4}$  inches long over all.

11. Make tenons on both ends:  $\frac{3}{8}$  inch long,  $\frac{3}{8}$  inch thick, and about two inches wide.

12. Remove the joint edges in accordance with the design on the slats.

13. Make the mortises on the second

and third rails to receive the tenons on the three slats respectively.

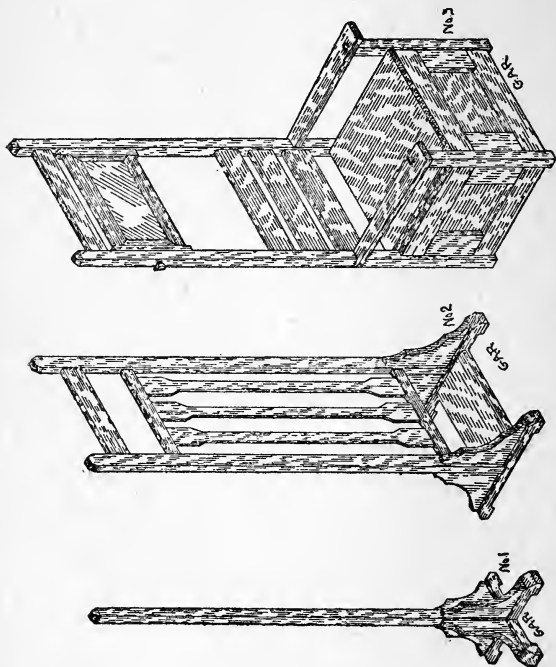


PLATE No. 7

14. Glue and fasten second and third rails onto slats.

15. Square up the two side pieces or





rests: 2 inches thick, 2 inches wide, 18 inches long.

16. Make a  $\frac{3}{4}$ -inch groove on the under-side of each.

17. Square up lower board: 1 inch thick, 8 inches wide by  $16\frac{3}{4}$  inches long over all.

18. Make the tenons on board:  $\frac{3}{8}$  inch long,  $\frac{1}{2}$  inch thick, and about 5 or 6 inches wide.

19. Make mortises on lower side pieces to admit the tenons of lower board.

20. Glue and fasten the two side pieces onto lower board.

21. All rails, together with the slats, can now be fastened onto the poles.

22. Make the bracket: 1 inch thick,  $7\frac{1}{2}$  inches wide, and 10 inches long.

23. When the brackets have been completed, fasten same onto the poles and rests as explained in connection with hall tree No. 1.

Costumer No. 3 has a mirror which can be turned to any position desired. At the

lower end there is a box with a lid which serves as a seat. Within the box may be placed rubbers, overshoes and the like. A leather cushion may be placed upon the seat to make it more comfortable.

Hall tree No. 3 requires the following pieces.

Two long poles— $1\frac{1}{2} \times 1\frac{1}{2} \times 67\frac{1}{2}$  inches.

Two front vertical posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 23$  inches.

One top rail— $\frac{3}{4} \times 3 \times 20$  inches.

One second rail— $\frac{3}{4} \times 4 \times 20$  inches.

One third rail— $\frac{3}{4} \times 4 \times 20$  inches.

One fourth rail— $\frac{3}{4} \times 4\frac{1}{2} \times 20$  inches.

One front upper rail for framework seat— $\frac{3}{4} \times 4 \times 20$  inches.

One front lower rail— $\frac{3}{4} \times 4 \times 20$  inches.

One back upper rail— $\frac{3}{4} \times 4 \times 20$  inches.

One back lower rail— $\frac{3}{4} \times 4 \times 20$  inches.

One vertical front rail (left side)— $\frac{3}{4} \times 4 \times 9$  inches.

One vertical front rail (right side)— $\frac{3}{4} \times 4 \times 9$  inches.

One front panel— $\frac{1}{4} \times 9 \times 13$  inches.

One back panel— $\frac{1}{4} \times 9 \times 20$  inches.

Two side upper rails— $\frac{3}{4} \times 4 \times 18$  inches.

Two side lower rails— $\frac{3}{4} \times 4 \times 18$  inches.

Four vertical side rails (right and left sides)— $\frac{3}{4} \times 4 \times 9$  inches.

Two side panels (right and left sides)— $\frac{1}{4} \times 9 \times 11$  inches.

One bottom— $\frac{1}{2} \times 18 \times 20$  inches.

One seat— $\frac{7}{8} \times 20$  (wide)  $\times 20$  inches long.

Make the width from two boards.

Two arms— $\frac{7}{8} \times 3\frac{1}{2} \times 21$  inches.

Two cleats— $\frac{7}{8} \times \frac{7}{8} \times 18$  inches.

Two horizontal rails (for frame of mirror)— $\frac{7}{8} \times 1\frac{1}{2} \times 17\frac{3}{4}$  inches.

Two vertical rails (for mirror)— $\frac{7}{8} \times 1\frac{1}{2} \times 13\frac{1}{2}$  inches.

Follow carefully each step in constructing hall tree No. 3.

1. Square up long poles:  $1\frac{1}{2} \times 1\frac{1}{2} \times 67$  inches.

2. Make bevel on upper end.

3. Square up upper rail first:  $\frac{3}{4} \times 2\frac{1}{2} \times$

19 $\frac{3}{4}$  inches over all. Make tenons  $\frac{3}{8}$  inch long and  $\frac{3}{8}$  inch thick on all rails,  $\frac{3}{4}$  inch in thickness.

4. Square up second rail:  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all.

5. Square up third rail:  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all.

6. Square up fourth rail:  $\frac{3}{4} \times 4 \times 19\frac{3}{4}$  inches over all.

7. Square up upper back rail (below seat):  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all.

8. Square up lower back rail:  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all.

9. Make mortises on long vertical poles (inside) to admit all the above rails.

10. Square up front vertical posts:  $1\frac{1}{2} \times 1\frac{1}{2} \times 22\frac{1}{2}$  inches over all.

11. Square up upper front horizontal rail (below seat):  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all.

12. Square up lower front horizontal rail:  $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{3}{4}$  inches over all. Make tenons on rails.

13. Make mortises on front posts for upper and lower front rails.

14. Square up two front vertical rails:  $\frac{3}{4} \times 3\frac{1}{2} \times 8\frac{3}{4}$  inches over all. Make tenons.

15. Make mortises on upper and lower front horizontal rails for the above two vertical rails.

16. Glue and clamp the above rails (four) together.

17. Make inside groove for front panel.

18. Square up front panel:  $\frac{1}{4} \times 8\frac{3}{4} \times 12\frac{3}{4}$  inches and fasten in place.

19. Square up the two upper side rails:  $\frac{3}{4} \times 3\frac{1}{2} \times 17\frac{3}{4}$  inches over all.

20. Square up the two lower side rails:  $\frac{3}{4} \times 3\frac{1}{2} \times 17\frac{3}{4}$  inches over all.

21. Make tenons on the above rails and mortises for same on long poles and from vertical posts.

22. Square up the four side vertical rails:  $\frac{3}{4} \times 3\frac{1}{2} \times 8\frac{3}{4}$  inches over all.

23. Make all tenons on the above ver-

tical rails and mortises for same on upper and lower side rails.

24. Make the grooves for the panels.

25. Square up the panel boards:  $\frac{1}{4} \times 8\frac{3}{4} \times 10\frac{3}{4}$  inches.

26. Glue all rails and clamp in place until dry.

27. Square up the seat:  $\frac{7}{8} \times 19\frac{3}{4} \times 19$  inches.

28. Square up two cleats:  $\frac{7}{8} \times \frac{7}{8} \times 17\frac{3}{4}$  inches, to fit immediately below the seat and on the inside of the two upper side rails.

29. Square up the two arms, each  $\frac{7}{8} \times 3 \times 21\frac{1}{2}$  inches. The arms are three inches wide at the front end and two inches wide at the rear end.

30. Make small squares on arms to fit over front posts. Make rear opening on arms to fit on long poles. See sketch "b."

31. Square up upper and lower rails for frame of mirror:  $\frac{7}{8} \times 1 \times 17\frac{1}{4}$  inches over all. Make tenons.

32. Square up the vertical rails:  $\frac{7}{8} \times 1 \times 13$  inches. Make mortises.

33. Make grooves for mirror and glue frame together.

34. Sandpaper and clean all parts before finishing.

35. Screw mirror in place. Perspective No. 3 shows the panel pieces placed inside.

In almost every case, the joints used in fastening the various parts of the three hall trees are some variation of the mortise and tenon joint.

The tenons used on the horizontal rails of the frame for the mirror, are the common or stub mortise and tenon and are made by cutting only two sides of tenon beam.

The horizontal side rails A and B below seat in figure No. 3 are made with tenons like those on an end lap joint. The end lap fits into the posts. See sketches "a" and "b."

Note how the rear of the arm pieces are



cut to fit the long poles in detail drawing  
“b.”

The panels fit within a groove.

The cleats are screwed in place.

### **Five Hints to Amateurs**

1. In sandpapering straight surfaces, a block of wood should be used upon the sandpaper.

2. In striking a chisel a mallet should be used. If the chisel is kept keen, there will be no necessity for the use of a mallet for small cuts.

3. Give your work a final treatment from a critical standpoint before sandpapering or assembling.

4. Do not depend upon sandpaper doing the work. Use it for cleaning only and smoothing surfaces after all tool processes have been completed.

5. Do not trace any work.

A bad man quarrels with his tools.

## MAGAZINE STANDS

### ARTICLE VIII

As magazine stands are always received with much interest, the author takes pleasure in introducing four more similar drawings into the course.

Simplicity marks the construction of the cabinets as shown on plate 8. The joints used for stands No. 1 and No. 2, are the plain butt joints. In a plain butt joint, the pieces join endwise or edgewise without overlapping. Such an application of joints is commonly noticeable on ordinary boxes or cases, as seen at the grocery or dry goods stores.

Order the following pieces at the mill for No. 1:

Two sides— $\frac{7}{8} \times 10\frac{3}{4} \times 34\frac{1}{2}$  inches.

Four shelves— $\frac{7}{8} \times 10\frac{3}{4} \times 16\frac{1}{2}$  inches.

Four strips— $\frac{1}{2} \times 2\frac{1}{4} \times 18\frac{1}{4}$  inches.

1. Make the sides first. When planed

and squared up, they are  $\frac{7}{8}$  inch thick,  $9\frac{3}{4}$  inches wide and 34 inches long.

2. Locate and draw lines across the faces for the shelves.

3. On above lines mark off places for screws. Bore holes on said pieces with a gimlet 3-16 or  $\frac{1}{4}$  bit. The size of the holes depends upon the thickness of the screws used.

4. On side pieces make upper and lower designs as shown in drawing.

5. Plane and square up the shelves  $\frac{7}{8}$  inch thick,  $9\frac{3}{4}$  inches wide and 16 inches long.

6. Make the four strips  $\frac{1}{2}$  inch thick,  $1\frac{3}{4}$  inches wide and  $17\frac{3}{4}$  inches long.

7. Screw shelves in place with round headed blued screws.

8. Nail strips in place on the rear.

Magazine stand No. 2 is similar in construction to No. 1 with the exception of the shelves, which are 19 inches in length

and the solid back in place of the four strips.

Magazine stand No. 3 requires the following pieces:

Six pieces— $\frac{7}{8} \times 2\frac{1}{2} \times 32\frac{1}{2}$  inches.

Four shelves— $\frac{7}{8} \times 8\frac{1}{2} \times 21\frac{1}{4}$  inches.

Note carefully how to construct the vertical pieces. Instead of ordering six pieces for the sides as given above, two boards can be purchased,  $\frac{7}{8}$  inch thick,  $32\frac{1}{2}$  inches long,  $9\frac{1}{2}$  inches wide and planed up in the following manner:

1. Plane joint or working edge;
2. Plane one end square with the joint edge;
3. Plane board to length (32 inches) and square to joint edge;
4. From joint edge mark off 2 inches (the width of one side piece) and draw line with a "straight edge;"
5. From latter mark off  $\frac{1}{4}$  inch and draw line (the  $\frac{1}{4}$  inch space just made is for sawing);
6. From the second line thus far constructed, mark off 2 inches for the second side piece and draw line;
- 7.

Draw another  $\frac{1}{4}$ -inch space for sawing; 8. Mark off the last strip and draw line; 9. Plane all side pieces down to line.

If the above method is followed, it is a simple matter to turn out each strip of the same length.

The shelves when finished are to be  $\frac{7}{8}$  inch thick, 8 inches wide and  $20\frac{3}{4}$  inches long. Note how the side strips are fitted onto the shelves.

For each strip use two round headed blued screws on every shelf. The spacing of the shelves might be reversed to suit the fancy of the worker.

A stand that differs considerably in design and makeup, is the one shown in drawing No. 4. The joints used on the rails are mortise and tenon.

Order the following pieces for the last cabinet:

Four corner posts— $1\frac{1}{8} \times 1\frac{1}{8} \times 40\frac{1}{2}$  inches.

One top— $\frac{7}{8} \times 18 \times 26\frac{3}{4}$  inches.

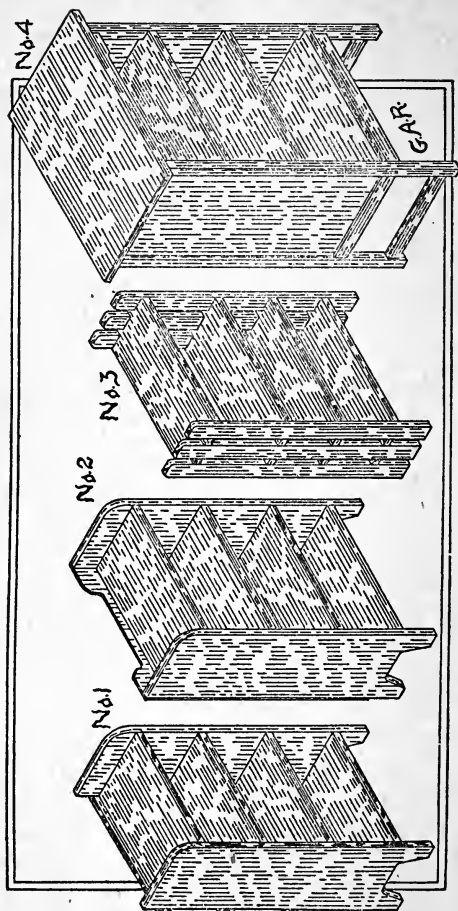


PLATE No. 8



Two upper side rails— $\frac{3}{4} \times 2\frac{1}{2} \times 14$  inches.

Two lower side rails— $\frac{3}{4} \times 2\frac{1}{4} \times 14$  inches.

Two bottom side rails— $\frac{3}{4} \times 2 \times 14$  inches.

Three shelves— $\frac{7}{8} \times 13\frac{1}{2} \times 21$  inches.

Two side panels— $\frac{3}{8} \times 14 \times 30$  inches.

The width and length of the shelves depend upon the methods used in fastening. The total width of the panel pieces must be made from two pieces.

The top shelf can be fastened by means of cleats or angles. The top when planed to size is  $\frac{7}{8} \times 17\frac{1}{2} \times 26\frac{1}{4}$  inches.

The corner posts are  $1\frac{1}{8}$  inches square by 40 inches long. The upper front rails are alike on both sides,  $\frac{3}{4} \times 2 \times 21$  inches long. The length of all rails depends upon the length of the tenons used. The measurement between the tenons for the above rails is 20 inches.

The upper side rails are  $\frac{3}{4} \times 2 \times 14$  inches. The measurement for the length between the tenons is 13 inches.

The lower side rails are  $\frac{3}{4} \times 1\frac{3}{4} \times 14$  inches.



The length between the tenons is 13 inches.

The bottom rails are  $\frac{3}{4} \times 1\frac{1}{2} \times 14$  inches. The length between the tenons is 13 inches.

The panel pieces are  $\frac{3}{8} \times 13\frac{3}{4} \times 29\frac{1}{2}$  inches.

Do not omit the grooves ( $\frac{3}{8}$  inch deep) on the inner sides of the corner posts and rails to admit the panel pieces. A matched or tongue and groove joint may be used for the above, especially onto the rails. Such a joint is made by making a projection or "tongue" in the center of the joint or other edge of one board and a corresponding groove in the center of the other, so that they will match together. For example, see flooring or some plain boxes.

Sketches a and a<sup>1</sup> show a simpler manner of fastening the panel onto the corner verticals.

Sketches b and c show how the shelves can be held in place by means of blocks or

cleats. Sketch b shows a square cleat and cone triangular in shape.

Detail sketches d and d<sup>1</sup> show another method of holding a shelf in place. The same is fitted into a notch made on the corner posts. The end of the shelf rests snugly against the panel.

The shelves can also be fastened with screws as shown on the foregoing three stands.

Magazine stands are sometimes recognized by the public by the names of magazine cabinets, book shelves or cases and library book shelves.

“The hand holds the place of honor at the side of the power of speech in raising man above the beasts!”

## HALL CHESTS

### ARTICLE IX

Specimens of furniture that will no doubt be warmly welcomed, are the hall chests shown on this page. Their practical value for storing away odds and ends excels that of any other article to be found in furniture.

To many, the first chest is known as a shirt waist box or skirt box and serves a purpose as its name signifies. Its length assures a comfortable storing place for skirts, petticoats, wearing apparel and remnants of dress goods and the like.

In hall chest No. 2, may be placed mackintoshes, rubbers, overshoes and the like.

Chest No. 1 may appropriately be used as a window seat. The seat of both chests, if upholstered with leather, will improve the appearance and give comfort to each piece.

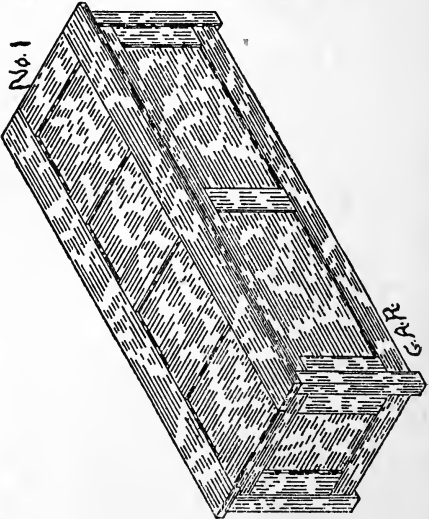
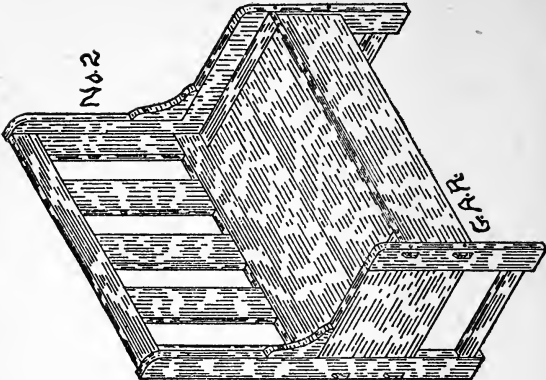


PLATE No. 9



Order the following pieces of lumber for chest No. 1:

Two horizontal front rails (upper and lower)— $\frac{3}{4} \times 3 \times 50$  inches.

Two horizontal back rails (upper and lower)— $\frac{3}{4} \times 3 \times 50$  inches.

Two front vertical rails— $\frac{3}{4} \times 3 \times 12$  inches.

Two back vertical rails— $\frac{3}{4} \times 3 \times 12$  inches.

One front vertical rail— $\frac{3}{4} \times 3\frac{1}{2} \times 12$  inches.

One back vertical rail— $\frac{3}{4} \times 3\frac{1}{2} \times 12$  inches.

Two front panels— $\frac{3}{8} \times 12 \times 21$  inches.

Two back panels— $\frac{3}{8} \times 12 \times 21$  inches.

Four corner posts— $1\frac{3}{4} \times 1\frac{3}{4} \times 16\frac{1}{2}$  inches.

One bottom— $\frac{5}{8} \times 15\frac{1}{2} \times 49$  inches.

Four end horizontal rails (two on each end)— $\frac{3}{4} \times 3 \times 15\frac{1}{2}$  inches.

Four end vertical rails (two on each end)— $\frac{3}{4} \times 3\frac{1}{2} \times 12$  inches.

Two end panels (one on each end)— $\frac{3}{8} \times 10 \times 12$  inches.

Two long rails for top— $\frac{7}{8} \times 4\frac{1}{2} \times 53\frac{1}{2}$  inches.

Five short rails for top— $\frac{7}{8} \times 4\frac{1}{2} \times 12$  inches.

Four panels for top— $\frac{3}{8} \times 9 \times 12$  inches.

Use mortise and tenon joints.

Sketch "b" shows a vertical cross section at "a." "X" and "y" are the rails, "r" and "s" in the end view. The cross section shows how the panels are fitted into the rails.

The total length and width of the panel pieces and the total length of the rails depend upon the size of the tenons used. Nevertheless, be careful to obtain the correct measurements between them.

With the exception of the corner posts, all pieces should be made of cedar. The measurements for every piece, omitting the tenons, are as follows, when completed:

Four horizontal rails (front and rear)— $\frac{3}{4} \times 2\frac{1}{2} \times 48$  inches.

Four vertical rails (front and rear)— $\frac{3}{4} \times 2\frac{1}{2} \times 10$  inches.

Two vertical rails (front and rear)— $\frac{3}{4} \times 3 \times 10$  inches.

Four panels (front and rear)— $\frac{3}{8} \times 10 \times 20$  inches.

Four corner posts— $1\frac{3}{4} \times 1\frac{3}{4} \times 16$  inches.

Bottom— $\frac{5}{8} \times 14\frac{1}{2} \times 48$  inches.

Four end horizontal rails (two on each end)— $\frac{3}{4} \times 2\frac{1}{2} \times 14\frac{1}{2}$  inches.

Four end vertical rails (two on each end)— $\frac{3}{4} \times 3 \times 10$  inches.

Two end panels (one on each end)— $\frac{3}{8} \times 8\frac{1}{2} \times 10$  inches.

Two long rails for top— $\frac{7}{8} \times 4 \times 53$  inches.

Five short rails for top— $\frac{7}{8} \times 4 \times 11$  inches.

Four panels for top— $\frac{3}{8} \times 8 \times 11$  inches.

Order the following pieces for hall chest No. 2:

Two front verticals— $1 \times 3\frac{1}{2} \times 20\frac{1}{4}$  inches.

Two rear verticals— $1 \times 3\frac{1}{2} \times 40\frac{1}{2}$  inches.

Two pieces (front and rear for framework of box)— $\frac{7}{8} \times 8\frac{1}{2} \times 35$  inches.

Two lower horizontal side rails— $1 \times 2\frac{1}{4} \times 13\frac{1}{2}$  inches.



One bottom— $\frac{3}{4}$  or thinner  $\times 15\frac{3}{4} \times 32\frac{1}{2}$  inches.

Two side pieces— $1 \times 12\frac{1}{4} \times 12\frac{1}{2}$  inches.

Two brackets— $1 \times 4\frac{1}{2} \times 6\frac{1}{2}$  inches.

One upper back rail— $\frac{7}{8} \times 3\frac{1}{2} \times 33\frac{1}{2}$  inches.

One lower back rail— $\frac{7}{8} \times 4\frac{1}{2} \times 33\frac{1}{2}$  inches.

Two slats— $\frac{7}{8}$  (or thinner)  $\times 3\frac{1}{2} \times 18\frac{1}{2}$  inches.

Three slats— $\frac{7}{8}$  (or thinner)  $\times 4\frac{1}{2} \times 18\frac{1}{2}$  inches.

The seat: Two horizontal pieces doweled and glued together— $\frac{7}{8} \times 18 \times 29\frac{1}{2}$  inches.

Two end pieces, grooved and glued onto ends of horizontal pieces of seat— $\frac{7}{8} \times 2\frac{1}{2} \times 18$  inches.

The following are the dimensions for all pieces when planed and squared up to their correct measurements.

Two front verticals— $1 \times 3 \times 19\frac{7}{8}$  inches.

Note.—The small dimension as a rule denotes the thickness, the next in size the

width and the last the length. Order all lumber dressed on both sides.

Two rear verticals— $1 \times 3 \times 40$  inches.

Two pieces for framework of box— $\frac{7}{8} \times 8 \times 32$  inches inside. Add  $1\frac{3}{8}$  inch for tenons on both ends.

Two lower side rails— $1 \times 1\frac{3}{4} \times 12$  inches. Add  $1\frac{1}{4}$  inches for tenons on both ends of rail.

One bottom— $\frac{3}{4} \times 15\frac{1}{4} \times 32$  inches.

Two side pieces— $1 \times 11\frac{7}{8} \times 12$  inches.

Two brackets— $1 \times 4 \times 6$  inches.

Square up brackets,  $4 \times 6$  inches, before preceding with 5-inch curve.

One upper back rail— $\frac{7}{8} \times 3 \times 32$  inches, inside. Add  $1\frac{1}{4}$  inches for tenons on both ends.

One lower back rail— $\frac{7}{8} \times 3\frac{7}{8} \times 32$  inches, inside. Add  $1\frac{1}{4}$  inches for tenons.

Two slats— $\frac{7}{8}$  (or thinner)  $\times 3 \times 17$  inches, inside. Add  $1\frac{1}{4}$  inches for tenons.

Three slats— $\frac{7}{8}$  (or thinner)  $\times 4 \times 17$  inches, inside. Add  $1\frac{1}{4}$  inches for tenons.

The whole thickness, width and length of seat when completed, are  $7\frac{7}{8} \times 17\frac{5}{8} \times 32$  inches.

Detail sketch "s" shows how the 2-inch end pieces are fitted onto the horizontal pieces of the seat. Do not omit the dowels or pins. A matched or tongue and groove joint can be used to support the bottom.

The horizontal boards for the front and rear of the seat are alike and for its fastening, a pinned mortise and tenon joint is used. It is one in which a pin is driven through holes bored through the mortised beam and through the tenon to keep them from drawing apart. Examine your window sash and see if an example of such can not be found.

"Lest we forget" the author has shown on this page by means of sketches, a satisfactory method used by many cabinet makers in "squaring up" a board to its dimensions.

An outline for "squaring up" a board

appeared in article II, under "Hints to Amateur Workers."

"Progress means action and action means life."

## THREE STOOLS

### ARTICLE X

An article that can readily find a place in almost any room and serve comfortably as a chair, is a stool. The stools shown in the working drawings are minus a back, cushioned and require but little space wherever placed.

Stool No. 2 is serviceable as a foot-rest.

The cushions in stools Nos. 1 and 3 are made after all parts have been assembled, glued and allowed to dry. The cushion for stool No. 1 is fitted snugly within the upper rails and one inch from the top, resting upon cleats  $\frac{7}{8}$ -inch square, as shown in the drawing. The top leather of stool No. 3 is stretched tightly over the rails and is held in place by means of bronze tacks. Purchase a hard leather for the above cushioned seats.

Order the following pieces of lumber for stool No. 1:

Four corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 15\frac{1}{2}$  inches.

Two upper side rails— $1 \times 4\frac{1}{2} \times 18\frac{1}{2}$  inches.

Two upper end rails— $1 \times 4\frac{1}{2} \times 14\frac{1}{2}$  inches.

Two lower end rails— $1 \times 2 \times 14\frac{1}{2}$  inches.

Two lower side rails— $1 \times 2\frac{1}{2} \times 21$  inches.

Four wooden pins— $\frac{3}{8}$  or  $\frac{1}{2}$  inch in diameter by 2 inches long.

Two cleats— $\frac{7}{8} \times \frac{7}{8} \times 18$  inches.

Two cleats— $\frac{7}{8} \times \frac{7}{8} \times 12$  inches.

1. Plane up the corner posts first:  $1\frac{1}{2} \times 1\frac{1}{2}$  inches (square)  $\times 15$  inches. Do not omit  $\frac{1}{4}$ -inch chamfers on upper ends.

2. Square up the upper side rails:  $1 \times 4 \times 18\frac{1}{2}$  inches. The measurement between the tenons is 17 inches.

3. Make mortises on corner posts corresponding to the above tenons on upper rails.

4. Square up the two upper end rails:

1x4x14 $\frac{1}{2}$  inches over all. The measurement between the tenons is 13 inches.

5. Make mortises on corner posts to admit tenons of the two upper end rails.

6. Square up the two lower end rails: 1x1 $\frac{1}{2}$ x14 $\frac{1}{2}$  inches over all. The measurement between the tenons is 13 inches.

7. Make the mortises on corner posts to admit the tenons of the above rails.

8. Square up the two lower side rails: 1x2x20 $\frac{3}{4}$  inches over all.

9. Make mortises on corner posts for tenons on above rails. The joints are the open mortise and tenon with pins. The tenon passes through the mortise.

10. Scrape, clean and glue, assemble and clamp all parts in place until dry.

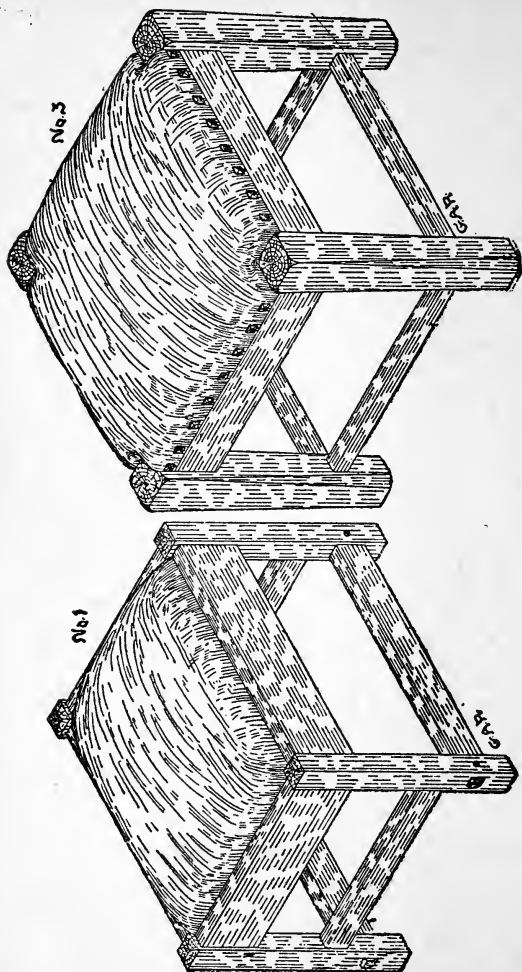
11. Make four cleats and screw in place.

12. Make cushion and fit in place upon cleats.

Stool No. 2 requires the following pieces:

One top— $\frac{5}{8}$ x9 $\frac{1}{2}$ x15 $\frac{1}{2}$  inches.

Two legs— $\frac{3}{4}$ x9x9 inches.





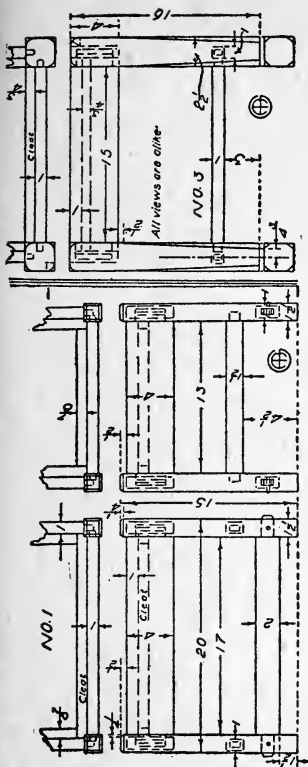
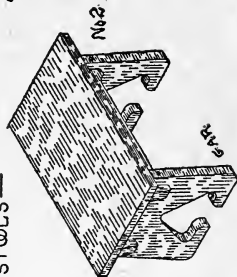


Plate 10



STOOLS—

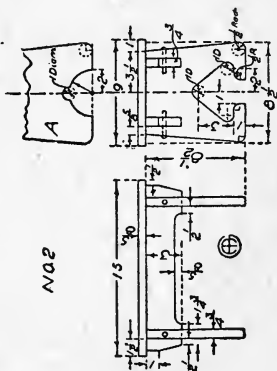


PLATE No. 10

Two rails— $\frac{3}{4} \times 3\frac{1}{2} \times 14\frac{1}{2}$  inches.

Four dowel pins— $\frac{3}{8}$  or  $\frac{1}{2}$  inch in diameter by  $2\frac{1}{2}$  inches each.

The top when squared up is  $5\frac{5}{8} \times 9 \times 15$  inches.

The legs are  $3\frac{3}{4} \times 8\frac{1}{2} \times 8\frac{1}{2}$  inches.

Draw a center line after the legs have been planed up  $8\frac{1}{2}$  inches square. Then proceed in laying out the design.

Figure A shows another method for designing the legs.

Square up the rails  $3\frac{3}{4} \times 3 \times 14$  inches.

Make the openings on the upper ends of the legs to receive the rails. The same are  $3\frac{3}{4}$  inch wide and 3 inches long.

Next give to the rails their other proportions.

Bore holes through edges of legs and faces of rails for the dowel pins.

If access cannot be had to a band saw, remove the design on the legs with a turn saw.

The top of the stool can be fastened to the rails by means of cleats, blocks or iron angles.

The height of stool No. 3 is that of a

chair. The legs of this chair can be tapered and the position of the lower rails changed, if so desired.

Order the following pieces for stool No. 3:

Four corner posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 16\frac{1}{2}$  inches.

Four top rails— $1 \times 4\frac{1}{2} \times 16\frac{1}{2}$  inches.

Four lower rails— $1 \times 1 \times 16\frac{1}{2}$  inches.

Four cleats— $\frac{3}{4} \times \frac{3}{4}$  or  $\frac{7}{8} \times \frac{7}{8} \times 15$  inches.

As the stool is square, all its corresponding elements are made alike. The corner posts when completed are  $2\frac{1}{2} \times 2\frac{1}{2}$  inches (square)  $\times 16$  inches. Make curves on upper corners and taper legs as shown in the drawing.

Square up the top rails  $1 \times 4 \times 16\frac{1}{2}$  inches. The measurment within the tenons is 15 inches.

Make the mortises on corner posts to receive the tenons.

The lower rails when planed up and squared are  $1 \times 1 \times 16\frac{1}{2}$  inches over all. The

measurement between the tenons is 15 inches.

Make the mortises for the tenons on lower rails. The cleats are  $\frac{7}{8}$  of an inch square by 15 inches. The same are screwed to the inner sides of the upper rails and 1 inch from the top.

Clean all parts well, glue and clamp until dry. Allow the clamps to remain in place about twelve hours.

The cushions required for stools Nos. 1 and 3 can be made with or without springs. The kind of springs generally used are 8 inches. For the cushions above, especially in such cases as specified in No. 1, an open box is made of four pieces. The width of these should be about  $2\frac{1}{2}$  inches. Across the bottom of the open box or frame are mortised and set in about three pieces of wood to form slats on which to set the springs. The tops of the springs should be tied or anchored with stout twine running in both directions, and fastened to

the inside of the pieces forming the open box. The springs must be tied securely so they cannot slip from their fastenings and come in contact with adjacent springs.

For such furniture as shown on this page, the roan or pebbled leather has come into favor. In stool No. 1 the leather is drawn over the springs and tacked to the outside of the open frame.

When the cushion has been completed, the whole is set upon the cleats which are placed 1 inch from the top rails. The location as to the height of the cleats, however will depend upon the kind of cushions used or made.

### **Five Hints to Amateur Woodworkers**

1. To chisel an opening in a board across the grain and to avoid the same from splitting out on the other side, place or clamp a board behind the opening.

2. On concave cuts work the cutting tool from the outside towards the center of

the curve. On convex cuts, work the cutting tool from the highest point or center in downward direction.

3. Drive nails or brads at an angle—the same will hold more securely.

4. On concave cuts use the beveled side of the chisel, also when the wood has a tendency to chip and break.

5. The common planes used in bench work are a block plane to plane the end grain, a smooth-plane about 8 inches in length; a jack plane from 12 to 14 inches in length; a fore-plane from 22 to 26 inches in length and a jointer from 28 to 30 inches in length.

“Man only understands thoroughly that which he is able to produce.”—Froebel.

## UMBRELLA STANDS

### ARTICLE XI

An article that will receive a hearty welcome in every home is an umbrella stand, examples of which are shown in plate XI. This piece of furniture, besides being an appropriate receptacle for umbrellas, serves adequately well as a place for canes or walking sticks.

Copper or brass pans to catch the drippings of an umbrella are to be provided for in each stand. These pans should be made to rest on strips as designated in the working drawings.

The pans can easily be made at home. Some of the following will, however, be necessary in perfecting a brass or copper drip pan. 1 hand vise, 1 small ball pein hammer, 1 prick punch, 1 jewelers' saw (4 inches deep), 1 chasing hammer, 1 dozen extra blades, 1 round end mallet, 1 set (6)

chasing tools, 1 6-inch flat file, 1 pair No. 12 snips, 1 4-inch flat file, 1 4-inch round file, 1 sheet emery cloth.

The above is a complete list of articles that are essential in general hammered metal work.

Soft sheet copper can be had upon the market in sheets about 30x60 inches. Copper or brass is numbered according to thickness or gauge.

Soft sheet brass comes in rolls about 12 inches wide.

Mortise and tenon joints are used in the making of the three umbrella stands shown on this page.

Stand No. 1 requires the following pieces:

4 corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 29\frac{1}{2}$  inches.

4 top rails— $\frac{3}{4} \times 3 \times 13\frac{1}{2}$  inches.

4 rails— $\frac{3}{4} \times 2\frac{1}{2} \times 13\frac{1}{2}$  inches.

4 bottom rails— $\frac{3}{4} \times 3 \times 13\frac{1}{2}$  inches.

Make the corner posts first:  $1\frac{1}{2} \times 1\frac{1}{2} \times 29$





inches. The taper on the top is to follow next.

The top rails are  $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 12 inches long (between tenons). The total length of all rails, including the tenons, is  $13\frac{1}{2}$  inches.

The second are to be  $\frac{3}{4}$  inch thick, 2 inches wide and 12 inches long between the tenons.

The bottom rails are to be  $\frac{3}{4}$  inch thick  $2\frac{1}{2}$  inches wide and 12 inches long between the tenons.

Do not omit the mortises on the corner post for all tenons on the rails.

Provide strips for drip pans.

Umbrella stand No. 2 is divided into halves by cross rails.

Order the following pieces for Stand No. 2.

4 corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 29\frac{1}{2}$  inches.

2 upper side rails— $\frac{3}{4} \times 3\frac{1}{2} \times 21\frac{1}{2}$  inches.

2 upper end rails— $\frac{3}{4} \times 3\frac{1}{2} \times 13\frac{1}{2}$  inches.

2 lower side rails— $\frac{3}{4} \times 3 \times 21\frac{1}{2}$  inches.

2 lower end rails— $\frac{3}{4} \times 3 \times 13\frac{1}{2}$  inches.

2 vertical end rails— $\frac{3}{4} \times 2\frac{1}{2} \times 21\frac{1}{2}$  inches.

1 center top rail— $\frac{3}{4} \times 3\frac{1}{2} \times 13\frac{1}{2}$  inches.

1 center bottom rail— $\frac{3}{4} \times 3 \times 13\frac{1}{2}$  inches.

The four corner posts when completed are  $1\frac{1}{2} \times 1\frac{1}{2}$  inches square by 29 inches.

Make the taper on the top ends.

The two upper side rails when completed are  $\frac{3}{4}$  inch thick, 3 inches wide and 20 inches long—including tenons,  $21\frac{1}{2}$  inches.

The bottom side rails when squared up are  $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 20 inches long—including tenons,  $21\frac{1}{2}$  inches.

The top end rails are to be  $\frac{3}{4}$  inch thick, 3 inches wide and 12 inches long—including tenons,  $13\frac{1}{2}$  inches.

The bottom end rails are to be  $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 12 inches long—including tenons,  $13\frac{1}{2}$  inches.

The two vertical end rails are to be  $\frac{3}{4}$  inch thick, 2 inches wide and 20 inches long—including the tenons,  $21\frac{1}{2}$  inches.

The top center rail when squared up  $\frac{3}{4}$  inch thick, 3 inches wide and 12 inches long—including tenons,  $13\frac{1}{2}$  inches.

The bottom center rail is  $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 12 inches long—including tenons,  $13\frac{1}{2}$  inches.

Make the mortises for all tenons of rails on corner posts.

Provide strips for two drip pans.

Umbrella stand No. 3, like that of No. 1, has all four views alike.

Order the following pieces for stand No. 3:

4 corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 30\frac{1}{2}$  inches.

4 top rails— $\frac{3}{4} \times 3 \times 14\frac{1}{2}$  inches.

4 lower rails— $\frac{3}{4} \times 2\frac{1}{2} \times 14\frac{1}{2}$  inches.

4 bottom rails— $\frac{3}{4} \times 3 \times 14\frac{1}{2}$  inches.

12 slats— $\frac{1}{2} \times 2\frac{1}{2} \times 20$  inches.

Note the following measurements for all pieces in umbrella stand No. 3 when completed.

4 corner posts— $1\frac{1}{2} \times 1\frac{1}{2}$  inches (square) by 30 inches long. Make top tapers.

4 top rails— $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 13 inches long—including tenons,  $14\frac{1}{2}$  inches.

4 lower rails— $\frac{3}{4}$  inch thick, 2 inches wide and 13 inches long—including tenons,  $14\frac{1}{2}$  inches.

4 bottom rails— $\frac{3}{4}$  inch thick,  $2\frac{1}{2}$  inches wide and 13 inches long—including tenons,  $14\frac{1}{2}$  inches.

12 slats— $\frac{1}{2}$  inch thick, 2 inches wide and  $18\frac{1}{2}$  inches long—including tenons, 20 inches long.

Locate and make mortises on corner posts for tenons on all rails. The slats are also mortised onto rails.

### **Five Hints to Amateur Woodworkers**

1. Do not neglect the use of a marking gauge.
2. Draw lines on work requiring excellent results with a knife or similar tool.
3. Chalk lines should not be used in

furniture construction. Same can be applied conveniently to larger structures as found in carpentry.

4. Do not drive a screw into a board. Its holding qualities are not strengthened thereby.

5. The simple cuts in woodwork are: straight edge cut, cross cut, diagonal cut, bevel cut, convex cut and concave cut.

**Special Note.**—The author wishes to call attention to the illustrations used in connection with this series of drawings. To some readers the mechanical drawings may appear confusing and it is because of this fact that a brief explanation is herewith given.

In ordinarily representing a perspective view of an object, the drawing is obtained by looking from some one fixed point, while a view represented by a mechanical drawing, as shown above, supposes the observer to be looking from an infinite number of points, and always in parallel lines.

The illustration of the sewing table in Plate IV, however, was a perspective drawing drawn by means of mechanical instruments and in accordance with mechanical principles.

## BENCHES

### ARTICLE XII

The first bench, as shown on plate 12, is especially designed to serve as a piano bench. Bench No. 2 is of practical value when used as a hall or window seat.

In the piano bench the seat acts as a cover on a box underneath which are two compartments of ample size wherein sheet music can be stored. Hence Bench No. 1 serves a double purpose, that of a piano bench and music cabinet inclusive.

The style of hinges, fasteners, catches or hooks to be chosen is left to the fancy of the worker. The rails of the above bench are "set or let into" the edges of the ends, so the outside of the rails and end boards will be flush. The rails may be put in place with glue and round head blued or brass screws. The kind of screws used depends upon the style of finish given to the grain.



The stretcher has a tenon  $2\frac{1}{2}$  inches wide and  $1\frac{1}{2}$  inches long, cut on each end which fits into a mortised cut in each end piece. A mortise is cut into the tenon to admit a key.

In the hall or window bench the joints on all its pieces are the mortise and tenon.

As specified in the drawing of bench No. 1, cleats should also be provided in bench No. 2.

Bench No. 1 requires the following pieces:

One seat— $1 \times 15\frac{1}{2} \times 36\frac{1}{2}$  inches.

Two rails— $\frac{7}{8} \times 4\frac{1}{2} \times 33\frac{1}{2}$  inches.

Two ends— $1 \times 14 \times 17\frac{1}{2}$  inches.

One bottom— $\frac{1}{2} \times 12 \times 31\frac{1}{2}$  inches.

Two cleats— $\frac{7}{8} \times 4\frac{1}{2} \times 12$  inches.

One center piece— $\frac{1}{2} \times 4 \times 12$  inches.

One stretcher— $1 \times 5\frac{1}{2} \times 36\frac{1}{2}$  inches.

Two keys— $\frac{3}{4} \times \frac{3}{4} \times 4$  inches.

1. The seat when squared up will be  $1 \times 15 \times 36$  inches.

Plate 12  
No. 2

—BENCHES—

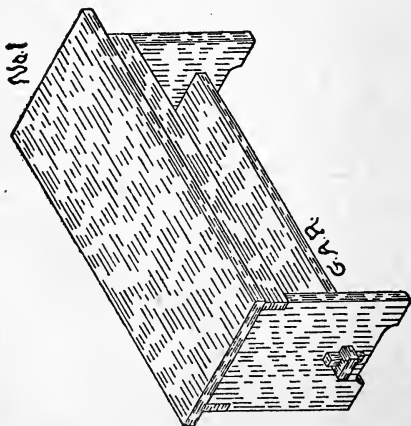
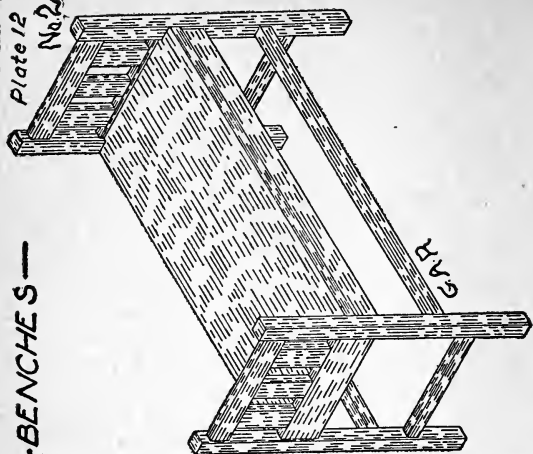


PLATE No. 12



2. The two rails are to be  $\frac{7}{8} \times 4 \times 33$  inches each.

3. The two ends when planed to size measure  $1 \times 13\frac{1}{4} \times 17$  inches.

4. The bottom board will measure  $\frac{1}{2} \times 31 \times 11\frac{1}{2}$  inches.

5. Make the two cleats  $\frac{7}{8} \times 4 \times$  (a little less than)  $11\frac{1}{2}$  inches.

6. The centerboard is to measure  $\frac{1}{2} \times 31\frac{1}{2} \times 11\frac{1}{2}$  inches.

7. The stretcher should be squared up to  $1 \times 5 \times 36$  inches.

8. The keys are to be  $\frac{3}{4} \times \frac{3}{4}$  inches at the top end,  $\frac{3}{4} \times \frac{1}{2}$  inches at the lower end and  $3\frac{1}{2}$  inches long.

9. Make mortises on end pieces for tenons on stretcher as stated above.

10. Make mortises on tenons of stretcher for keys.

11. The cleats are screwed onto the under side of the seat.

12. Clean and sandpaper all parts well before assembling.

Bench No. 2 requires the following pieces:

Four corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 28\frac{1}{2}$  inches.

One seat— $1 \times 13\frac{1}{2} \times 36\frac{1}{2}$  inches.

Two side rails— $\frac{3}{4} \times 3 \times 36$  inches.

Two end rails— $\frac{3}{4} \times 4\frac{1}{2} \times 13\frac{1}{2}$  inches.

Two top end braces— $\frac{3}{4} \times 2\frac{1}{2} \times 13\frac{1}{2}$  inches.

Two side braces— $1 \times 1 \times 36\frac{1}{2}$  inches.

Two bottom end braces— $1 \times 1 \times 13\frac{1}{2}$  inches.

Six slats— $\frac{3}{4} \times 2\frac{1}{2} \times 6$  inches.

Note the following measurements for each piece of Bench No. 2 when squared up:

1. Four corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 28$  inches.

2. One seat— $1 \times 13 \times 36$  inches.

3. Two side rails— $\frac{3}{4} \times 2\frac{1}{2} \times 36\frac{1}{4}$  inches or more over all;  $35\frac{1}{2}$  inches between tenons.

4. Two end rails— $\frac{3}{4} \times 4 \times 12\frac{3}{4}$  inches or more over all—12 inches between tenons.

5. Two top end braces— $\frac{3}{4} \times 2 \times 12\frac{3}{4}$

inches or more over all—12 inches between tenons.

6. Two side braces— $1 \times 1 \times 36\frac{1}{4}$  inches, between tenons  $35\frac{1}{2}$  inches.

7. Two lower end braces— $1 \times 1 \times 12\frac{3}{4}$  inches or more over all—between tenons 12 inches.

8. The six slats are each to measure  $\frac{3}{4} \times 2 \times 5\frac{3}{4}$  inches—between tenons 5 inches.

Use mortise and tenon joints in each case.

Do not omit the cleats for the seat.

The seat is fastened on the underside by means of cleats to the four rails.

## HINTS TO AMATEURS

### The Knife and Some Possibilities for its Use

The terms “whittling” and “knife work” are expressions that stand for a system of manual training for children from nine to twelve years of age; a system that can be operated in the ordinary school-room or

workroom at home without a large outlay for extra room and equipment; a system in which the knife is the only cutting tool.

In selecting the knife there are a number of points to be considered. The quality of the steel should be of the best and the blade carefully tempered so that it will hold a keen cutting edge. If the temper is too hard, the edge will nick and break, and if too soft, the edge will turn over, giving a great deal of trouble and doing poor work. The construction of the knife should be good and the design such that it is well adapted to the work to be done and to the capacity of the user. There are a number of styles of knives which are used for this work. The ordinary two bladed pocket knife or jack-knife, the round handled knife with the fixed blade, the sloyd-pattern knife with a fixed blade. Of these three styles of knife, the sloyd-pattern, commonly known as the sloyd-knife, seems to be the best adapted to schoolroom or children's work

in thin wood. Because of the thin edge on the pocket knife which makes it difficult to keep it in good order, the sloyd-knife has the advantage over the pocket knife.

The second form of knife has a wide blade, ground from edge to back, making it very hard to whet properly. The sloyd-knife will not close up; the blade has a thick, strong back, and is ground from the edge to the center, insuring a strong cutting edge; the point of the blade is strong and centrally located. These knives are made in several sizes, but the most suitable one, for young workers, is the size with a two and one-half inch blade.

When the knife first comes from the maker, it is not in condition to do good whittling; it has what may be termed a commercial edge; that is, the edge is ground quite blunt or bluff, so that it will not be easily damaged while in stock. The first thing before using the knife is to whet it to a thin keen edge.



The proper way to whet a knife is to lay the blade on the whetstone and whet a straight bevel from the edge to the center of the blade. The very appearance of a knife so sharpened carries with it the idea of keenness and cut. In the sloyd-knife, this gives a wide bevel and at the same time, on account of the thickness of the blade, insures a strong edge. In whittling with a knife whet in this way, the bevel forms a support for the blade and a shaving can be taken off while the blade is still in contact with the wood the whole width of the bevel, thus insuring a straight cut. When whetting a knife, use both right and left hands, always keeping the edge of the knife turned toward or away from you. Lay the blade flat on the stone and rub back and forth the full length of the latter, not in circles.

A good oilstone is an absolute necessity. Whet the knife on one side until you can feel, by running your finger over the opposite side, that the edge is beginning to turn

or rough up, then whet the other side until the edge turns back. This rough edge is called a wire edge, and shows that the edge is whetted down very thin. The wire edge must be removed by "strapping" (stropping) or by cutting into a piece of waste wood that lies handy. For strapping, select a piece of belt leather and glue it to a board. Coat the surface of the leather with flour emery and oil. Use just enough oil to make the emery into paste. Rub the knife the full length of the "strap," (strop) drawing it away from the edge and turning it over at each stroke. The wire edge will soon be gone and a keen cutting edge be obtained, with which the finest shavings can be removed. If good results are wanted, keep the knife in good order.

## MUSIC RACK AND CABINET

### ARTICLE XIII

The parts of the music rack No. 1 are all fastened by means of mortise and tenon joints. The detail sketch "a" shows how the corners of the shelves are to be fitted into the corner posts.

Order the following pieces at the mill for the music rack No. 1:

Four corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 39\frac{1}{2}$  inches.

Four shelves— $\frac{3}{4} \times 15\frac{1}{2} \times 25\frac{1}{2}$  inches.

Five slats in rear— $\frac{1}{2} \times 1\frac{1}{2} \times 25$  inches.

Six slats, three in a side— $\frac{1}{2} \times 1\frac{1}{2} \times 25$  inches.

One back rail— $\frac{3}{4} \times 3 \times 25\frac{1}{2}$  inches.

Two side rails, top— $\frac{3}{4} \times 3 \times 15\frac{1}{2}$  inches.

One back rail, bottom— $\frac{3}{4} \times 2\frac{1}{2} \times 25\frac{1}{2}$  inches.

Two side rails, bottom— $\frac{3}{4} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

When squared up and finished, all parts measure as follows:

Four corner posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 39$  inches.

Four shelves— $\frac{3}{4} \times 15 \times 25$  inches.

(Note how shelves are to be fitted into corner posts from detail sketch "a").

Five slats in rear— $\frac{1}{2} \times 1\frac{1}{4} \times 25\frac{1}{4}$  inches or longer; between tenons,  $24\frac{1}{2}$  inches.

Six slats, three on a side— $\frac{1}{2} \times 1\frac{1}{4} \times 25$  inches or longer; between tenons,  $24\frac{1}{2}$  inches.

One back rail, top— $\frac{3}{4} \times 2\frac{1}{2} \times 25\frac{1}{4}$  inches or longer; between tenons, 24 inches.

Two side rails, top— $\frac{3}{4} \times 2\frac{1}{2} \times 15\frac{1}{4}$  inches or longer; between tenons, 14 inches.

One back rail, bottom— $\frac{3}{4} \times 2 \times 25\frac{1}{4}$  inches or longer; between tenons, 24 inches.

Two side rails, bottom— $\frac{3}{4} \times 2 \times 15\frac{1}{4}$  inches or longer; between tenons, 14 inches.

Do not omit the tenons and mortises in their respective places.

Music Cabinet No. 2 has a door and adjustable shelves.

Shelves "U" and "V" have tenons  $\frac{1}{2}$  inch thick by 2 inches wide and pass through mortises of the same dimensions on the large side pieces. Pins, which go through the tenons, hold the above shelves in place.

The music cabinet requires the following pieces:

Two side pieces— $1 \times 16\frac{1}{2} \times 40\frac{1}{2}$  inches.

Two shelves, U and V— $1 \times 16 \times 23\frac{1}{2}$  inches.

One top rail, "a"— $1 \times 4\frac{1}{2} \times 22$  inches.

One bottom rail— $1 \times 2\frac{1}{2} \times 22$  inches.

The door:

Two vertical pieces— $1 \times 4\frac{1}{2} \times 30\frac{1}{2}$  inches.

Two horizontal pieces— $1 \times 4\frac{1}{2} \times 13\frac{1}{2}$  inches.

One panel— $\frac{3}{8} \times 13 \times 23$  inches.

The inside:

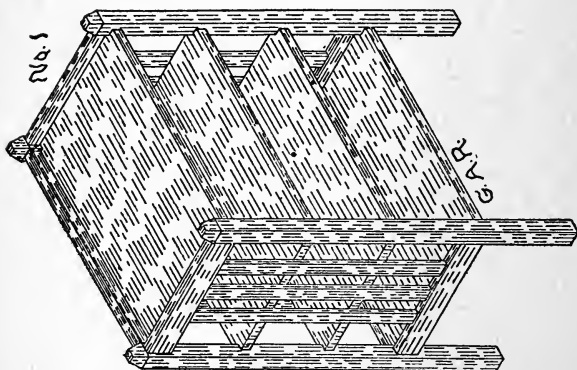
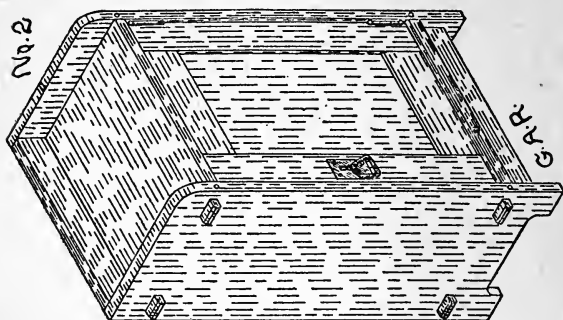
Four strips, "s"— $\frac{1}{2} \times 1\frac{1}{2} \times 30\frac{1}{2}$  inches.

Five shelves— $\frac{3}{8} \times 14 \times 20\frac{1}{2}$  inches.

Five rests, "r"— $\frac{1}{2} \times 1\frac{1}{2} \times 13\frac{1}{2}$  inches.

The rear:

Two vertical pieces, "b"— $1 \times 2\frac{1}{2} \times 30\frac{1}{2}$  inches.



One horizontal piece, "c"— $1 \times 2\frac{1}{2} \times 21\frac{1}{2}$  inches.

—MUSIC RACK AND CABINET—

**Plate 13**

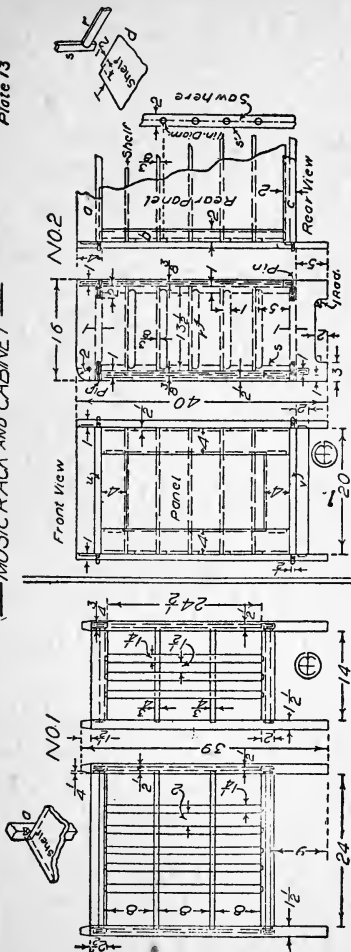


PLATE No. 13

One panel— $\frac{3}{8} \times 18 \times 30\frac{1}{2}$  inches.

The following are the dimensions for the above pieces when reduced to size:

Two side pieces— $1 \times 16 \times 40$  inches.

Two shelves, “u” and “v”— $1 \times 15 \times 23$  inches.

One top rail, “a”— $1 \times 4 \times 21\frac{1}{2}$  inches.

One bottom rail— $1 \times 2 \times 21\frac{1}{2}$  inches.

The door:

Two vertical pieces— $1 \times 4 \times 30$  inches.

Two horizontal pieces— $1 \times 4 \times 13$  inches.

One panel— $\frac{3}{8} \times 12\frac{1}{2} \times 22\frac{1}{2}$  inches.

The inside:

Four strips, “s”— $\frac{1}{2} \times 1 \times 30$  inches.

Five shelves— $\frac{3}{8} \times 13\frac{1}{2} \times 20$  inches.

Five rests, “r”— $\frac{1}{2} \times 1 \times 12\frac{1}{2}$  inches.

The rear:

Two vertical pieces, “b”— $1 \times 2 \times 30$  inches.

One horizontal piece, “c”— $1 \times 2 \times 21\frac{1}{2}$  inches.

One panel— $\frac{3}{8} \times 17 \times 30$  inches.

Detail sketch S<sup>1</sup> shows how the strips required on the inside of the cabinet can be



made from one board. The distance between centers of the 1-inch holes is 5 inches.

Detail sketch "d" shows how the five shelves are to be cut on the ends. The same rest on r<sup>1</sup>.

**Gluing.**—When ready for use, the glue should be hot and of the consistency of thin syrup. It must be applied with a brush, in a thin uniform coating, to both surfaces that are to be joined, and must be well brushed into the pores of the wood. Too much glue will prevent the pieces from coming together at the joint. The application should be made as quickly as possible, because glue begins to cool and set as soon as it is taken from the pot; it will set less quickly if the pieces to be glued are warmed. After the pieces have been put together, they should be rubbed to squeeze out the surplus glue, and finally clamped in place and allowed to remain until dry—at least twelve hours.

In gluing large surfaces, such as veneers

which must be secured to their foundations, a considerable amount of apparatus is required. Before the glue is applied, a heating box or chamber, which is maintained at a high temperature by coils of steam pipe, is used to heat the pieces to be united, and very heavy clamps are required to squeeze the superfluous glue from the joint. It is important to remember that while the film of glue uniting two pieces should always be continuous, the pieces themselves should be brought as closely together as possible.

When end grain is to be glued, it should first be sized; that is, coated with a thin glue, in order to fill the pores of the wood, and allowed to dry before the joint is made. Otherwise, the glue that is put into the joint is drawn off into the grain and becomes useless as a fastening.

An example of good gluing is found in the common lead pencil, the wooden portion of which consists of two strips glued to-

gether. The line of the joint can readily be traced upon the end of the pencil, but if the work is well done, it will be found that while the joint is a strong one, the amount of glue between the pieces is so small as to be scarcely visible.

Liquid glues are supplied by the trade. They require no heating and are, therefore, always ready for use.

—W. F. M. Goss.

Work promotes health and wealth, withholds from many a sin, strengthens against many a temptation, and gives consolation and peace of mind in the evil day.

## MISSION CHAIRS

### ARTICLE XIV

An article of furniture of necessity in every household is a chair. In the making of the chairs shown herewith the best material that can be used is oak, but white pine may also be used with good results.

In finishing, the wood should be stained the color preferred and finished with a wax preparation. Experience will readily show that a stain will penetrate wood to some depth and when given a semi-polish with some wax preparation, the finish will be found to be more serviceable than a high piano finish. A marred or scratched finish can be restored to its former condition by applying the proper wax preparation.

For cushions and upholstering, Spanish leather will be found most satisfactory and to surpass any other material for a similar use. Substitutes for the above are linen,

velour, cotton velvet, arras cloth or panta-sote. The above materials can be purchased from large furniture dealers or at large department stores. Loose cushions may also be used to great advantage in so far that they allow each piece to be thoroughly dusted and renovated.

A false bottom is to be provided, as shown by the broken lines in the working drawing. The same should be held up by small strips, about seven-eighths inch square nailed around the inside of the three inch pieces. The working drawing shows the false bottom to be three-quarters inch in thickness, but it can, however, be made a little thinner and raised higher.

A good layer of upholstering hair should be placed over the false bottom. The leather seat, or whatever material that may be used, is then to follow, stretched tightly and held in place by temporary tacks. Bronze, antique copper, dull finished brass or wrought iron upholstering nails are next

driven in about every inch, and the temporary tacks withdrawn.

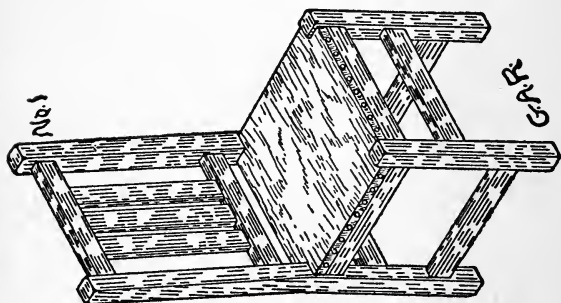
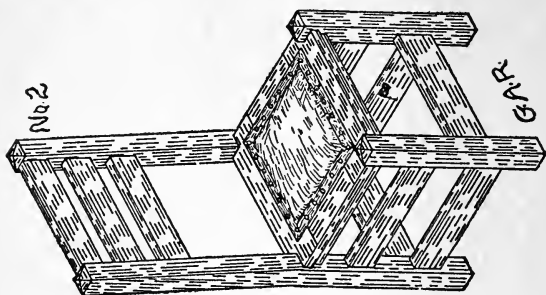


PLATE No. 14

Order the following pieces for chair No. 1:

Two front legs— $1\frac{3}{4} \times 1\frac{3}{4} \times 19$  inches.

## —MISSION CHAIRS—

Plate 14

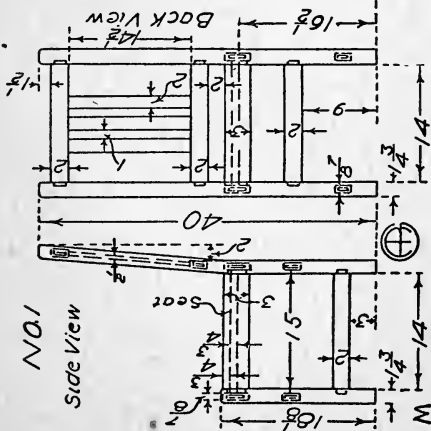
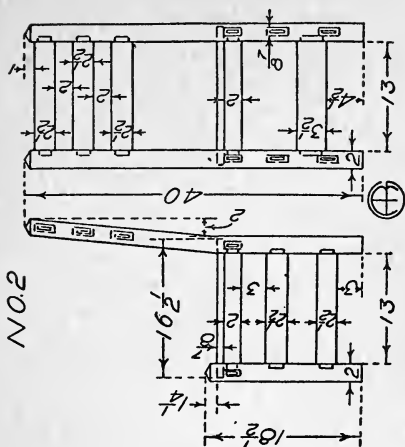


PLATE No. 14

Two rear legs— $1\frac{3}{4} \times 4 \times 40\frac{1}{2}$  inches.

Note—Four inches is to be ordered for the width to allow for the slight angles given to the rear legs.

Four crosspieces (about seat)— $\frac{7}{8} \times 3\frac{1}{2} \times 15\frac{1}{2}$  inches.

Two crosspieces (front and rear)— $\frac{7}{8} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

Two crosspieces (on either side)— $\frac{7}{8} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

Two crosspieces (on rear legs)— $\frac{7}{8} \times 2\frac{1}{2} \times 15\frac{1}{2}$  inches.

Three slats— $\frac{1}{2} \times 2\frac{1}{2} \times 16$  inches.

Note the steps as follows in working up the above chair:

1. Square the legs to size, the front legs are  $1\frac{3}{4} \times 1\frac{3}{4} \times 18\frac{1}{8}$  inches; the rear legs  $1\frac{3}{4} \times 1\frac{3}{4} \times 40$  inches. Do not omit the angle of two inches.

2. The four crosspieces about seat measure  $\frac{7}{8} \times 3 \times 15\frac{1}{2}$  inches over all; between tenons 14 inches.

3. Two crosspieces on front and rear



are to be  $\frac{7}{8} \times 2 \times 15\frac{1}{2}$  inches over all; between tenons 14 inches.

4. The two crosspieces on either side, when completed, will measure  $\frac{7}{8} \times 2 \times 15\frac{1}{2}$  inches over all; between tenons 14 inches.

5. The crosspieces on the rear legs will be  $\frac{7}{8} \times 2 \times 15\frac{1}{2}$  inches over all—between tenons 14 inches.

6. The three slats on the rear legs must each measure  $\frac{1}{2} \times 2 \times 16$  inches over all—between tenons  $14\frac{1}{2}$  inches.

Around the inside of the 3 inch pieces which support the seat,  $\frac{7}{8}$  inch square strips should be fastened for the seat board to rest on. The seat board is held securely in place by glue and screws; the same will keep the chair rigid. Upholstering hair is then placed upon the seat and leather stretched as explained above.

The pieces of both chairs are assembled with simple mortise and tenon joints. Do not omit the proper tenons and mortises on the various pieces.

Order the following pieces for chair No. 2:

Two legs (front)— $2 \times 2 \times 19$  inches.

Two legs (rear)— $2 \times 4 \times 40\frac{1}{2}$  inches.

Four crosspieces under seat— $\frac{7}{8} \times 2\frac{1}{2} \times 14\frac{1}{2}$  inches.

Four crosspieces on sides— $\frac{7}{8} \times 3 \times 14\frac{1}{2}$  inches.

Two crosspieces on front and rear— $\frac{7}{8} \times 4 \times 14\frac{1}{2}$  inches.

Three crosspieces on rear legs— $\frac{7}{8} \times 3 \times 14\frac{1}{2}$  inches.

One seat— $\frac{7}{8} \times 17 \times 17$  inches.

See mechanical perspective and note how the seat is faced with leather. The seat can be made from strips about 4 inches wide and doweled together.

### Hints to Amateurs

One of the principal tools of carpentry is the hammer. The heads of all hammers are generally made of steel. The face, that portion which comes in contact with the head of a nail when struck, is hardened so

as not to be injured by repeated blows upon the nail. The body struck by the face of the hammer must be considerably softer, for should the case be the reverse, the hammer would show an impression.

When hard substances are struck by a hammer precaution must be taken that the face of the latter is not badly scarred.

That portion upon a hammer which enables the withdrawing of nails, is called the claw.

Hammers are arranged in size according to their weight. The same vary in size from seven to twenty ounces.

The kind of hammer usually employed by bench workers weighs from fourteen to sixteen ounces.

“Manual training is the greatest thing that has come into our public schools. It is the one and only bridge over which the boy can walk into that work of activities he sees everywhere around him.”—Amelia Hyde Center, in the *School Century*.

## TWO COUCHES

### ARTICLE XV

As with all other pieces of furniture shown in this series of drawings, the handsome couches on plate No. 15 have been so designed as to come within amateur ability. Simplicity and strength are the predominant features in the structural makeup of each couch.

The following stock list of materials, ordered mill planed and sandpapered, will be sufficient to make up couch No. 1 as illustrated:

Two rails— $1 \times 6\frac{1}{2} \times 81\frac{1}{2}$  inches.

Two rails— $1 \times 6\frac{1}{2} \times 31\frac{1}{2}$  inches.

One rail (on end)— $1 \times 3\frac{1}{2} \times 31\frac{1}{2}$  inches.

One panel (on end)— $\frac{3}{8} \times 11 \times 31\frac{1}{2}$  inches.

One piece (H)— $\frac{3}{4} \times 3 \times 31\frac{3}{4}$  inches.

Two pieces (triangular)— $\frac{3}{4} \times 10\frac{1}{2} \times 18$  inches.

Thin strips on above triangular pieces  
enough for all lengths:

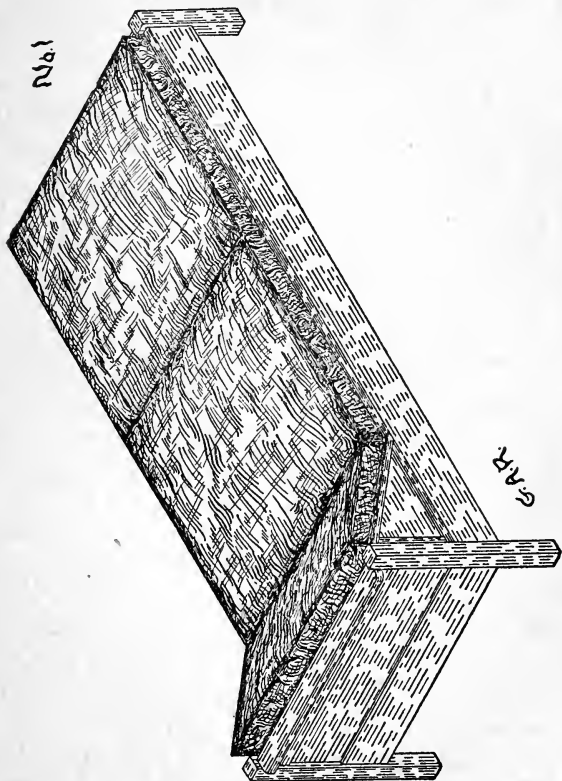
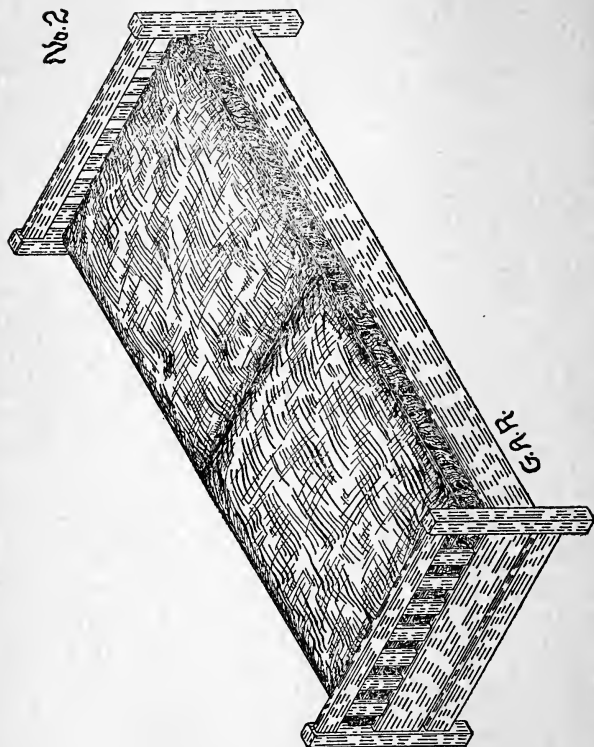


PLATE No. 15

Two strips— $\frac{1}{4} \times \frac{3}{4} \times 45$  inches.

Two posts—2x2x25 inches.

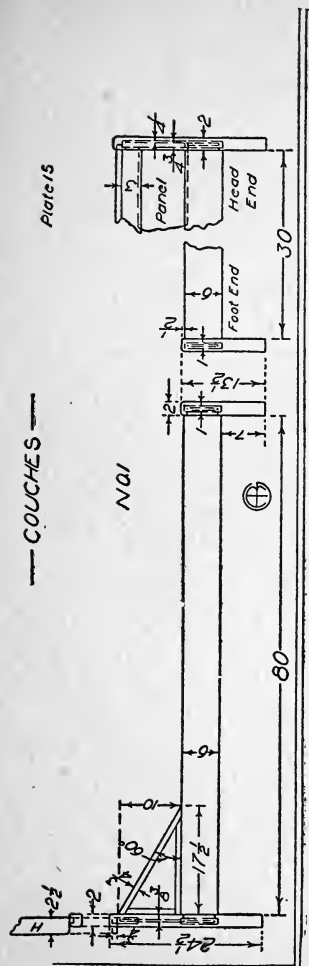
Two posts—2x2x14 inches.



The cushions may be made with or without springs as desired. If made without

COUCHES

Plate 15



NO.2

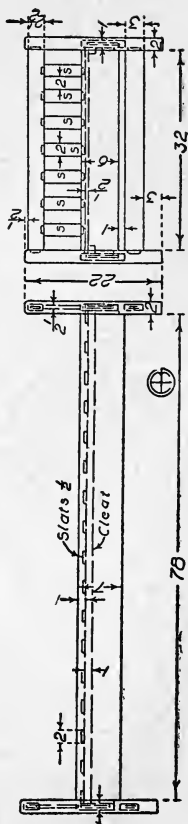


PLATE No. 15

springs, about 18 slats,  $\frac{1}{2}$  inch thick, 2 inches wide, and 31 inches long, must be provided for in the material list. The same are to be placed on cleats fastened to the inside of each side rail. The two cleats are fastened with screws. The height of these cleats will depend upon the kind of cushions used.

The cushions shown in the illustrations are upholstered with hair and stretched with leather. Note the arrangement of cleats and slats for cushions in working drawing for couch No. 2. The leather selected should be of a color that will harmonize with the wood finish which is applied to each piece of furniture.

For additional information on upholstering and the making of leather seats or cushions refer to the preceding articles: Article V, the corner chair; article X, stools, and article XIV, chairs. Soft leather, hard leather, sheep skin, roan or pebbled leather, chase leather, genuine cowhide



leather, linen velour, cotton, velvet and canvas are used in making cushions for chairs, couches, settles, davenports, etc. One long cushion and a short one for the head will be found equally satisfactory, instead of three as shown in the illustration. All rails are mortised into the posts for a depth of  $\frac{5}{8}$  inch or more. The vertical slats on the ends in No. 2, the panel, the headpiece (H) in No. 1 are also mortised. The material list has allowed for all tenons, but sufficient care must be taken to have all dimensions between tenons correct. Glue the joints together.

To the second piece of furniture, No. 2, may appropriately be ascribed the name couch bed. The same can be provided with a floss mattress and box spring. An embroidered canvas (or other material) spread, and a pillow for the head, will make the article complete.

Order the following pieces for couch No. 2:

Two rails (side)— $1 \times 7\frac{1}{2} \times 79\frac{1}{2}$  inches.

Two rails (end)— $1 \times 6\frac{1}{2} \times 33\frac{1}{2}$  inches.

Two rails (end)— $1 \times 3\frac{1}{2} \times 33\frac{1}{2}$  inches.

Two rails (end, top)— $1 \times 3 \times 33\frac{1}{2}$  inches.

Fourteen slats (on end)— $\frac{1}{2} \times 2\frac{1}{2} \times 7\frac{1}{2}$  inches.

Four posts— $2 \times 2 \times 22\frac{1}{2}$  inches.

Two cleats for cushion slats— $1 \times 1 \times 79\frac{1}{2}$  inches.

Seventeen slats for cushion— $\frac{1}{2} \times 2\frac{1}{2} \times 33\frac{1}{2}$  inches.

The letters "s" signify the slats on the ends.

### Hints to Amateurs

Some of the common joints used in various forms of wood construction:

1. A lapped and strapped joint.
2. A butted and doweled joint.
3. A fished joint.
4. A scarf or spliced joint.
5. A doweled butt joint (at right angles).
6. A toenail joint.

7. A drawbolt joint.
  8. A plain butt joint.
  9. A glued and blocked joint.
  10. A hopper joint.
  11. A halved joint.
  12. A cross lap joint.
  13. A middle lap joint.
  14. An end lap joint.
  15. A dovetail halving or lap dovetail joint.
  16. A beveled halving joint.
  17. A notched joint.
  18. A checked joint.
  19. A cogged or corked or caulked joint.
  20. A ledge or rebate or rabbet joint.
  21. A dado or gained or grooved joint.
  22. A dovetail dado joint.
  23. The common mortise and tenon joint.
  24. The through mortise and tenon joint.
  25. The blind mortise and tenon joint.
- “A well understood failure is of more value than a blindly achieved success.”

## THREE SMOKERS' TABLES

### ARTICLE XVI

A smoker's table will be found a most convenient piece of furniture in any household where smokers abide. In many homes, where the ash tray and its accessories are placed upon tables, the ownership of a smokers' table would eliminate the practice and save the table tops from being defaced by possible burns or scratches.

In a smoker's den or niche, a man's private room or study, a table, as shown on plate 16, will be most welcome.

The style of construction of the smokers' tables has purposely been so varied as to meet the peculiarities of taste which often arise in this connection.

Skilful workers and those who can manipulate a lathe, or those who are familiar with the hammered metal work will find great satisfaction and enjoyment in turning

out a set such as generally accompanies a table as shown on this page.

The legs or supports for table No. 1 are made of strips crossing some distance above the center at an angle. In joining the two pieces to form a leg, a cross lap joint is used. The joint is halved and both pieces project either way from the joint. It is necessary to use a bevel square in drawing and obtaining the different angles on the joints in question.

Order the following pieces at the mill for table No. 1:

Two strips (on legs)— $\frac{3}{4} \times 2 \times 41\frac{1}{2}$  inches.

Two strips (on legs)— $\frac{3}{4} \times 2 \times 35\frac{1}{2}$  inches.

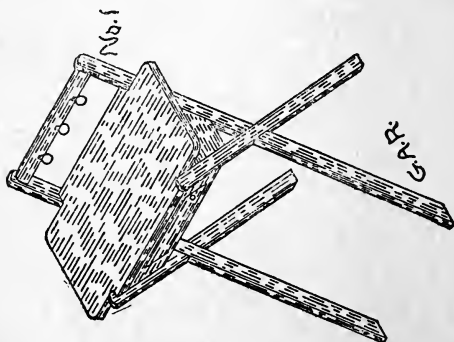
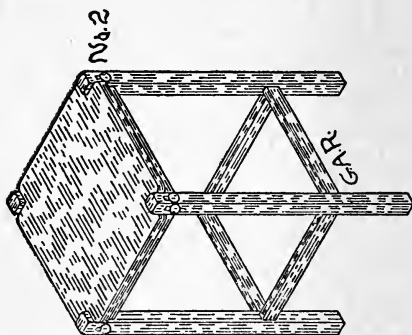
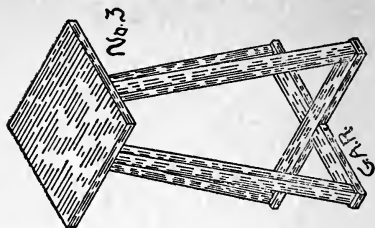
One top— $\frac{3}{4} \times 14 \times 24\frac{1}{2}$  inches.

Two side pieces (below top)— $\frac{3}{4} \times 5\frac{1}{2} \times 17$  inches.

Two end pieces (below top)— $\frac{3}{4} \times 5 \times 13$  inches.

One bottom— $\frac{3}{8} \times 8 \times 17$  inches.

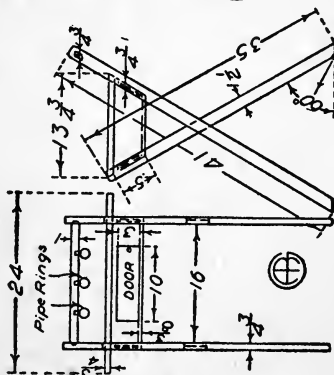
One door— $\frac{3}{4} \times 31\frac{1}{2} \times 10\frac{1}{2}$  inches.



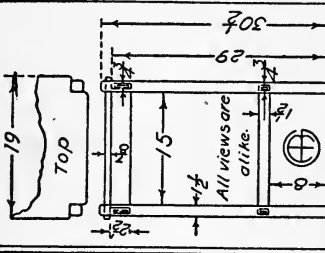
## — SMOKERS' TABLES —

Plate 16

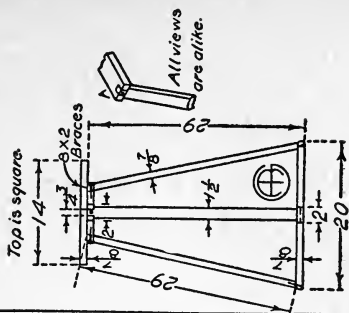
NO. 1



NO. 2



NO. 3



All views  
are alike.

PLATE No. 16

One piece (for pipe rings)— $\frac{3}{4} \times 1\frac{1}{2} \times 17$  inches.

Note from working drawing and illustration No. 1 how the table top and its compartment underneath are fitted within the cross pieces or legs. The door is large enough to admit a cigar box.

Table No. 2 requires the following pieces dressed on both sides:

One top— $\frac{7}{8} \times 19\frac{1}{2} \times 19\frac{1}{2}$  inches.

Four posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 31$  inches.

Four rails— $\frac{3}{4} \times 3 \times 16\frac{1}{2}$  inches.

Four rails— $\frac{3}{4} \times 2 \times 16\frac{1}{2}$  inches.

Use the mortise and tenon joint for the above rails. The top is fastened by means of cleats which are screwed on the inside of the top rails and underneath the top.

A table, as unique as No. 1, is the one shown in drawing No. 3. The legs are made of four strips. The bottom consists of two pieces which have been cross lapped. The braces beneath the top are made with cross-lap joints. Sketch "A" shows how the legs



are fitted into the ends of the upper braces. The joint here used is often called a slip, end or box or open mortise and tenon joint.

Table No. 3 requires the following pieces:

One top— $\frac{7}{8} \times 14\frac{1}{2} \times 14\frac{1}{2}$  inches.

Four pieces (for legs)— $\frac{7}{8} \times 2 \times 29\frac{1}{2}$  inches.

Two pieces (lower braces)— $\frac{7}{8} \times 2\frac{1}{2} \times 20\frac{1}{2}$  inches.

Two pieces (upper braces)— $\frac{7}{8} \times 2\frac{1}{2} \times 8\frac{1}{2}$  inches.

As explained in preceding articles, in order to obtain a true angle on the wood-work, a full size drawing must be made from the desired angles and transferred by means of a bevel square. The list of common joints from 1 to 25 was given in Article XV. Others follow here:

26. A wedge mortise and tenon joint.

27. The fox tail tenon joint.

28. The dovetail mortise and tenon joint.

29. A pinned mortise and tenon joint.

30. A keyed mortise and tenon joint.

31. A tusk tenon or shoulder tenon joint.
32. The double mortise and tenon joint.
33. A slip joint, end, open or box mortise and tenon joint.
34. A haunched mortise and tenon joint.
35. A housed mortise and tenon joint.
36. A through single dovetail joint.
37. The half lapped or half blind dovetail joint.
38. The mitered, secret or blind dovetail joint.
39. A beveled point.
40. A plain miter joint.
41. A doweled miter joint.
42. A spline miter joint.
43. A ledge and miter or lapped miter joint.
44. A miter and butt joint.
45. A stretcher joint.
46. A street joint.
47. A plain brace joint.
48. A housed brace joint.

49. An oblique mortise and tenon joint.
50. The bridle joint.
51. A bird's mouth joint.
52. A plain or rubbed joint.
53. A rebated, rabbeted or fillistered joint.
54. A matched or tongue and groove joint.
55. A beaded joint.
56. A spline joint.
57. A doweled joint.
58. A long edge miter joint.

Illustrations of some of the above joints are given in succeeding articles.

## THREE SCREENS

### ARTICLE XVII.

An article that is of practical value in any room of the home is a screen, three examples of which are shown in drawings of Plate XVII. The arrangement of the working drawings has been so made as to conform with their structural lines, addition of parts and with the developed skill necessary in the making of the screens.

Plain white oak or quartersawed oak are the best materials that can be chosen for the construction of the articles shown on this page. The same may be said of a great number of other pieces of furniture shown in this series of drawings and articles on home furniture making.

The first screen is 66 inches in height and 24 inches deep. The drawing of but one section, however, is shown. To be complete

each screen must have three such sections as are designated in the drawings.

Each section for No. 1 has two vertical pieces  $\frac{7}{8} \times 2\frac{1}{2} \times 66$  inches; one top piece,  $\frac{7}{8} \times 2 \times 19$  inches (inside), or  $20\frac{1}{2}$  inches overall. The overall dimension includes the tenons. The bottom piece is  $\frac{7}{8} \times 5 \times 19$  inches (inside), or  $20\frac{1}{2}$  inches overall.

Screen No. 1 can be made pleasing if paneled in Japanese grass cloth, in some canvas, in denim or leather. For one section Screen No. 1 requires the following pieces from the mill:

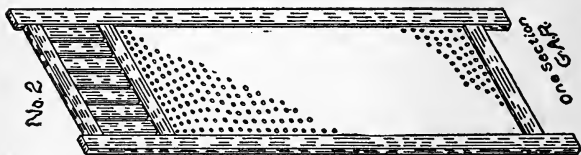
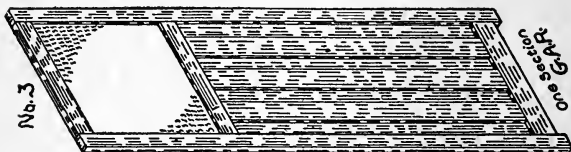
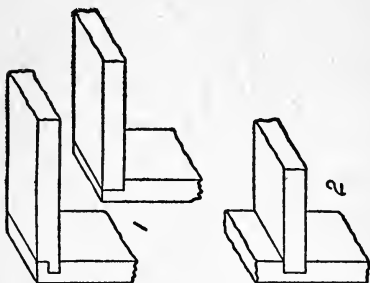
Two vertical pieces— $\frac{7}{8} \times 3 \times 66\frac{1}{2}$  inches.

One top piece— $\frac{7}{8} \times 2\frac{1}{2} \times 20\frac{1}{2}$  inches.

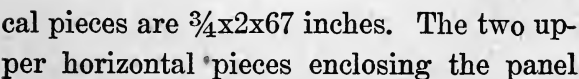
One bottom piece— $\frac{7}{8} \times 5\frac{1}{2} \times 20\frac{1}{2}$  inches.

The height of screen No. 2 is 68 inches and its width is 22 inches. Each section has two vertical pieces  $\frac{3}{4} \times 2\frac{1}{4} \times 68$  inches, two upper horizontal pieces,  $\frac{3}{4} \times 2 \times 17\frac{1}{2}$  inches (inside); or 19 inches overall, one bottom piece,  $\frac{3}{4} \times 2\frac{1}{4} \times 17\frac{1}{2}$  inches (inside), or 19 inches overall and seven slats on top,

$\frac{1}{2}$ x2x8 inches (inside), or  $9\frac{1}{2}$  inches over-



One section of screen No. 3 is 67 inches and 22 inches wide. The two outside verti-



are  $\frac{3}{4} \times 2 \times 18$  inches (inside),  $19\frac{1}{2}$  inches overall. The bottom horizontal piece is  $\frac{3}{4} \times 3 \times 18$  inches (inside),  $19\frac{1}{2}$  inches overall. Three inside pieces are  $\frac{3}{4} \times 3 \times 41$  inches. The thin panel pieces are  $\frac{3}{8} \times 2 \times 41$  inches. Order the following pieces in making screen No. 2. The list bears reference to one section only:

Two vertical pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 68\frac{1}{2}$  inches.

Two upper pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 19$  inches.

One bottom piece— $\frac{3}{4} \times 2\frac{1}{2} \times 19$  inches.

Seven slats— $\frac{1}{2} \times 2\frac{1}{2} \times 9\frac{1}{2}$  inches.

Each section for screen No. 3 requires the following pieces:

Two vertical pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 67\frac{1}{2}$  inches.

Two upper pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 19\frac{1}{2}$  inches.

One bottom piece— $\frac{3}{4} \times 3\frac{1}{2} \times 19\frac{1}{2}$  inches.

Three inside pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 41\frac{1}{2}$  inches.

Four panel pieces— $\frac{3}{8} \times 2\frac{1}{2} \times 41\frac{1}{2}$  inches.

Note—The panel cloth or leather can be held in place around its border by means of strips about  $\frac{3}{4}$  inch wide and about  $\frac{1}{4}$  of an inch thick. Do not omit to specify



enough material for strips in the mill order if the above method of fastening is observed.

Under the heading of "Hints to Amateurs" the author is giving in this and succeeding articles, clear illustrations of common joints that are met by woodworkers every day. Illustration 1 shows two types of a ledge, rebate or rabbet joint. Such joints are appropriate when applied to boxes.

Illustration 2 is a typical example of a dado, gained or grooved joint. For examples of such a joint one will have to look at the making of some boxes, the supporting of the bottom of a drawer or that of shelves on "uprights."

## **TWO PORCH SWINGS**

### **ARTICLE XVIII**

Spring and summer invite attention to the construction of various kinds of furniture for the lawn and porch. Winter, then, is the time to begin work on the above named articles to assure their completion when summer arrives. The lawn swings, as shown on this page, may be supported by means of ropes or chains (galvanized) hanging from heavy hooks fastened at the ceiling.

The swings will be found to be roomy and comfortable and to outwear any number of hammocks. That the porch swings can not turn over when swung can also be said of these pieces of furniture. Frequently swings of this nature are used with much satisfaction in play rooms.

To his skillful craftsmen the author suggests the problem of devising some practi-

cal means of changing one of these swings into a portable lawn swing, if so desired. This will necessitate a stand which, in its construction, must be rigid and substantial and one that can with ease be moved from place to place on the lawn.

The seat of a swing should hang about twenty inches from the floor or ground.

For cushions roanskin, cowhide, chase leather or canvas are often used. The seat proper can be made of cane in place of the thin boards shown in the drawings.

Use plain sawed white oak for either of the two swings.

Order the following pieces mill planed and sand papered for swing No. 1:

Two pieces (on seat, c)— $1 \times 2 \times 66\frac{1}{2}$  inches.

Two pieces (on seat),  $1 \times 2 \times 22$  inches.

Make side pieces on ends (A) from two pieces as follows:

Two pieces— $\frac{3}{4} \times 4\frac{1}{2} \times 23\frac{1}{2}$  inches.

Two pieces— $\frac{3}{4} \times 11 \times 13\frac{1}{2}$  inches.

The other pieces continued are:

One piece (on back, D) —  $\frac{3}{4} \times 4\frac{1}{2} \times 61$  inches.

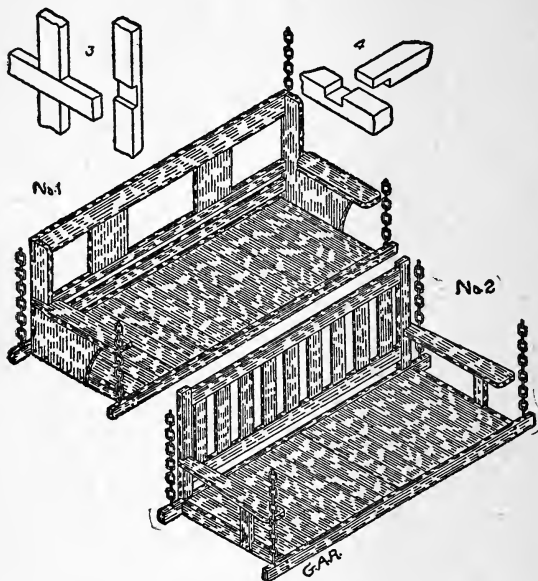


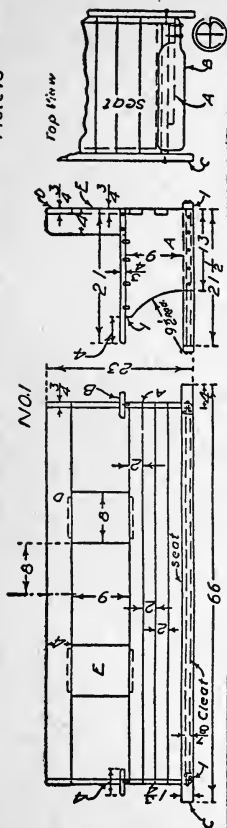
PLATE No. 18

Two pieces (on back) —  $\frac{3}{4} \times 21\frac{1}{2} \times 61$  inches.

Two pieces (arm rests, B) —  $\frac{3}{4} \times 4\frac{1}{2} \times 21\frac{1}{2}$  inches.

— PORCH SWINGS —

Plate 18



NO. 2

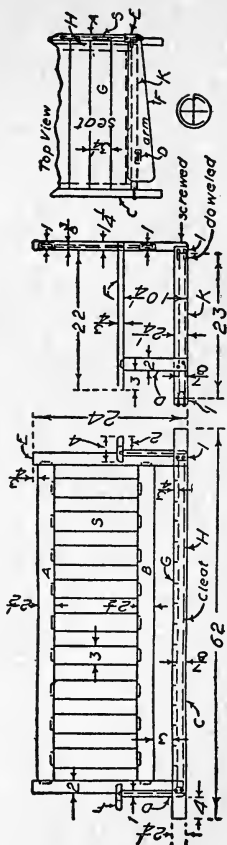


PLATE NO. 18

When ordering boards, whose dimensions are small, combine same into larger figures on length and width whenever possible. This method will save time to you and the workmen at the factory.

For example, when ordering the lumber for the seat, each board of which is  $21\frac{1}{2}$  inches long, take the length about three times for one piece. About two or three inches must be added to each to allow for waste. Continue this method of making out the mill order for the seat pieces until an account has been made for each one. The thickness of each piece for the seat should be  $\frac{1}{2}$  or  $\frac{3}{4}$  of an inch.

Two pieces, E— $\frac{3}{4} \times 8\frac{1}{2} \times 10\frac{1}{2}$  inches.

Two strips (for cleats)— $\frac{7}{8} \times \frac{7}{8} \times 57$  inches.

Two strips (for cleats)— $\frac{7}{8} \times \frac{7}{8} \times 22$  inches.

Order the following pieces at the mill for swing No. 2:

Two pieces (on seat, C)— $1 \times 2\frac{1}{2} \times 62\frac{1}{2}$  inches.

Two pieces (on seat, K)— $1 \times 2\frac{1}{2} \times 23\frac{1}{2}$  inches.

Two pieces (on back, A and B)— $1 \times 3 \times 51\frac{1}{2}$  inches.

Two pieces (on back, E)— $2\frac{1}{2} \times 14\frac{1}{4} \times 24\frac{1}{2}$  inches.

Nine slats (on back, S)— $\frac{3}{8} \times 3\frac{1}{2} \times 14\frac{1}{2}$  inches.

Figure lengths on slats as explained above.

Two pieces, D— $1 \times 2\frac{1}{2} \times 11$  inches.

Two pieces (arm rest), F— $\frac{3}{4} \times 4\frac{1}{2} \times 24$  inches.

Enough material to give 16 pieces for seat, each  $\frac{3}{4}$  of an inch thick and 23 inches long, G.

Two cleats, H— $\frac{7}{8} \times \frac{7}{8} \times 52$  inches.

### Common Joints

Fig. 3 shows a cross lap joint. The same is made by halving both pieces and allowing the same to project both ways from the joint. In making a halved joint half the

thickness of each piece must notch out and the remaining portion of one just fits into the notch in the other, so that the upper and under surfaces of the pieces are flush.

Fig. 4 shows a middle lap joint. The same is made similar to a cross lap joint except that the joint is at the end of both pieces.

It is well always to look for examples of the above named joints about the home.

“It is just where language fails that drawing is most effective in giving it a clear interpretation of ideas.”

—Prof. Nadler, Buda Pesth.



## TWO MORRIS CHAIRS

### ARTICLE XIX

Two Morris chairs of the craftsman order in design are shown on this page. The height of the seat from the floor and its location can be changed according to taste. For example, the front and rear horizontal rails may, with satisfactory results be lowered from its ascribed position or the framework for the cushion may be lifted to a higher level, etc. The seat, however, should not be shifted above its proper or normal height from the ground.

The cushions can be made fixed, loose, box form, or with the aid of springs. The last named is known as a spring seat cushion. The materials best or most chosen for the seat and back cushions are cotton, velvet, canvas, velour, denim, burlap, chase leather, genuine leather, Spanish roan skin, or sheepskin.

Art cushions made of leather retail from \$16 to \$20 a pair and those of denim and burlap at from \$6 to \$9. Cheaper grades, of course, can be gotten much cheaper. Nevertheless, the cushions can be made at home at a much less expense. The cushions may be filled with hair or cotton felt.

Loose spring seat cushions will be found to retain their shape under hard wear, if properly constructed. These cushions are provided with wood frames which slip just inside the frame of the chair. The seat can be removed whenever desired. The loose cushion on the back has no springs, but may be filled with hair, cotton, felt or Java floss.

(See Articles V, X, XIV, and XV.)

Morris chair No. 1 has notched pieces at the rear ends of the arms that allow the back to be adjusted to different angles.

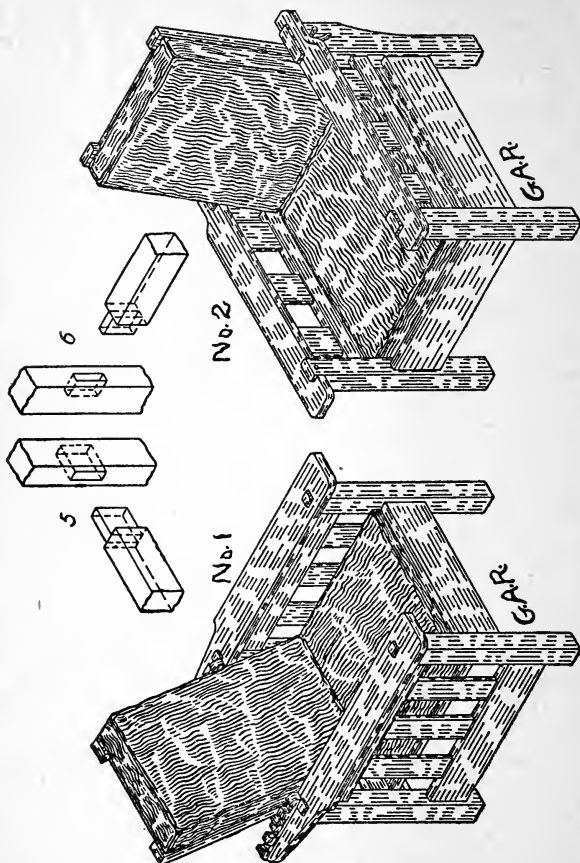
Morris chair No. 2, in order to incline the back, has a metal rod passing through an

open design cut in the sides of the rear legs.

The author's skillful workers, who have acquired some dexterity in handling the common tools of carpentry, may find delight in changing some of the chairs shown in this series of furniture drawings into rockers. If this change is to be made with the Morris chairs, the backs should be made "fixed."

The best rockers or rocking chairs are cut straight with the grain of the wood and then bent with steam pressure by bending machines. But our amateurs have no bending machines and, therefore, they must devise some scheme of their own in meeting this problem.

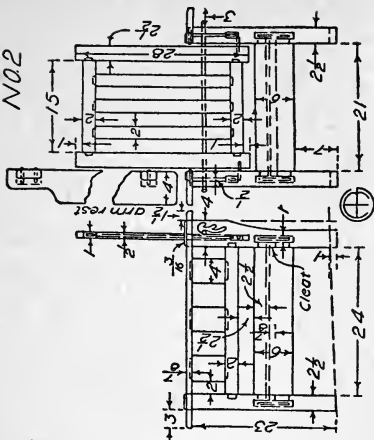
A wood or metal form, having the desired rocker shape, may be made, and the same, together with the material for the rocker, subjected to steam. The rocker piece should gradually be bent into shape by means of hand screws attached to the mold. There are still other methods used in bending



— MORRIS CHAIRS —

Plate 19

N02



N01

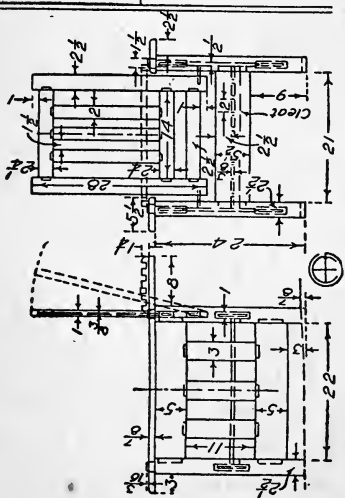


PLATE No. 19

rockers. The above manner of bending a rocker is entirely impossible with the scant facilities on hand in the little workshops and the home.

Rockers are often cut, but objection can be pointed out in this practice in so far that breaking often takes place when the rocker is cut on a curve that partly crosses the grain.

The following pieces of stock, mill planed and sandpapered on four sides, are necessary in making Morris chair No. 1:

Four posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 25\frac{1}{2}$  inches.

Two rails (front and back)— $1 \times 6 \times 23$  inches.

Four side rails— $1 \times 5\frac{1}{2} \times 24$  inches.

Six side slats— $\frac{1}{2} \times 3\frac{1}{2} \times 12$  inches.

Two arm pieces,  $\frac{7}{8} \times 6 \times 38\frac{1}{2}$  inches.

Nine (or less) slats (seat)  $\frac{3}{8} \times 2\frac{1}{2} \times 24$  inches.

Two cleats— $1 \times 1 \times 23$  inches.

Two back stiles— $1 \times 3 \times 28\frac{1}{2}$  inches.

Two back rails— $1 \times 2\frac{1}{2} \times 15$  inches.

One back rail (bottom)— $1 \times 3 \times 15$  inches.

Three back slats— $\frac{3}{8} \times 2\frac{1}{2} \times 18$  inches.

One back support— $\frac{7}{8} \times \frac{7}{8}$  or  $1 \times 1 \times 23$  inches.

Two support rests— $1 \times 1\frac{1}{2} \times 8\frac{1}{2}$  inches.

Two dowels (bottom of back)— $\frac{1}{2}$  inch diameter, 6 inches long.

Tenon the upper ends of the posts.

The projection above the arm rests is 3-16 inch and slightly beveled or rounded. Sandpaper, just enough to take off the sharp corners, the arms, legs and rails.

The rear legs on both Morris chairs are made shorter than the front legs. This is done so that the chairs may be properly inclined. To get the correct slant on the bottom ends of the legs, a "straight edge" should be laid so that its edge touches the bottom of the front post or leg at its front surface, but keep it  $\frac{7}{8}$  inch or 1 inch, as the drawing may call for, above the bottom of the rear post or leg. Mark with knife or

pencil along the "straight edge" across both posts.

The slats on the back can either be "let in" the whole end or the mortise and tenon joint used. In the former case the mortises in the rails will be  $\frac{3}{8} \times 2$  inches.

Use plain or quarter sawed oak in the making of both Morris chairs.

The stock necessary to make Morris chair No. 2, mill planed and sandpapered on four sides, is given in the following list:

Two posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 24\frac{1}{2}$  inches.

Two posts (rear)— $2\frac{1}{2} \times 4 \times 24\frac{1}{2}$  inches.

Two side rails— $1 \times 2\frac{1}{2} \times 26$  inches.

Two side rails— $1 \times 6\frac{1}{2} \times 26$  inches.

Two rails (front and rear)— $1 \times 6\frac{1}{2} \times 23$  inches.

Six slats (side)— $\frac{1}{2} \times 4\frac{1}{2} \times 6\frac{1}{2}$  inches.

Two arm pieces— $\frac{7}{8} \times 4\frac{1}{2} \times 35\frac{1}{2}$  inches.

Nine slats (on seat)— $1\frac{3}{8} \times 2\frac{1}{2} \times 26$  inches.

Two cleats— $1 \times 1 \times 23$  inches.

Two back stiles— $1 \times 3 \times 28\frac{1}{2}$  inches.

Two back rails— $1 \times 2\frac{1}{2} \times 17$  inches.



Three back slats— $1\frac{1}{2} \times 2\frac{1}{2} \times 22\frac{1}{2}$  inches.

One rod for back.

The joints used in assembling rails and slats are mortise and tenon.

The joints used in fitting the arm pieces onto the posts are filed by many woodworkers under the name of "middle lap" joint. Dowel pins are passed from the inner sides of the posts to insure holding of the arm pieces.

The rear legs of chair No. 2 are 4 inches wide at the upper ends and  $2\frac{1}{2}$  inches at the lower ends. Observe the construction of same in illustration and working drawing.

Before applying glue to any of the pieces of the chairs, have all clamps ready and set for use. Allow about twelve hours for glue to dry.

The joint shown in illustration 5 is that of a "through" mortise and tenon joint. The mortise is cut clear through one piece. The tenon is cut to a depth equal to or

more than the thickness of the mortised piece. The figure shows the cheeks of the tenon cut on two sides. The cheeks of a tenon may be cut on two or four sides.

Illustration 6 shows an example of the "blind" mortise and tenon joint. In such a joint the tenon does not extend clear through the mortised piece, as is the case of the "through" mortise and tenon joint. Figure 6 shows the cheeks of the tenon cut on two sides. The cheeks of the tenon may also be cut on two or four sides.

## LIBRARY TABLES

### ARTICLE XX

The library tables, the working drawings for which are here given, are mission in style and will be found both well proportioned and of pleasing appearance.

Order the stock from the mill and in so doing avoid the hard work of planing and sandpapering the table tops, stretchers, legs and panels.

Select quarter sawed white oak for your table.

Order the table top for No. 1 to size:  $1\frac{1}{8} \times 28 \times 44$  inches. In this case several pieces will be jointed and glued together. The top piece in its entirety is squared to thickness, width and length. Thus, we say, that when a board is to be treated or "squared up" on four sides or "surface" on four sides, it is s-4-s.

Order the following pieces for the rest of the table:

One stretcher— $1 \times 12\frac{1}{2} \times 42$  inches.

Four legs— $2\frac{1}{2} \times 2\frac{1}{2} \times 29\frac{1}{2}$  inches.

Two side rails— $1 \times 3\frac{1}{2} \times 35$  (or more) inches.

Two end rails (upper)— $1 \times 3\frac{1}{2} \times 22$  (or more) inches.

Two pieces (center, on end)— $1 \times 3\frac{1}{2} \times 22$  (or more) inches.

Two pieces (bottom, on end)— $1 \times 2\frac{1}{2} \times 22$  (or more) inches.

Four slats— $\frac{3}{8} \times 4 \times 9$  inches.

Four keys— $\frac{7}{8}$  (or  $\frac{3}{4}$ )  $\times \frac{3}{4} \times 3\frac{1}{2}$  inches.

For table No. 2 order the stock as specified above.

One top (s-4-s)— $11\frac{1}{8} \times 36 \times 53$  inches.

One stretcher (or shelf)— $11\frac{1}{8} \times 24\frac{1}{2} \times 49\frac{1}{2}$  inches.

Four legs— $3 \times 3 \times 30\frac{1}{2}$  inches.

Two side rails— $1 \times 5\frac{1}{2} \times 42$  (or more) inches.

Two end rails (upper)— $1 \times 5\frac{1}{2} \times 26$  (or more) inches.

Two end rails (lower)— $1 \times 4\frac{1}{2} \times 26$  (or more) inches.

Two slats— $\frac{3}{8} \times 6\frac{1}{2} \times 18$  inches.

Four slats— $\frac{3}{8} \times 3 \times 18$  inches.

Four keys— $\frac{7}{8} \times \frac{3}{4} \times 3\frac{1}{2}$  inches.

Figures A and B show methods of fastening a rail into a leg. Illustration A is that of a blind mortise and tenon joint; B is that of a haunched mortise and tenon joint.

Trim up all the legs to the proper size and then carefully mark off the mortises for the rails. The tenons on all rails and cross pieces are to be made next.

The table ends (the legs with all their rails, cross pieces and slats), should be glued up first and the glue allowed to harden, after which the tenons of the shelf may be inserted into their mortises and the side rails placed.

Make the mortise for the keys to be placed

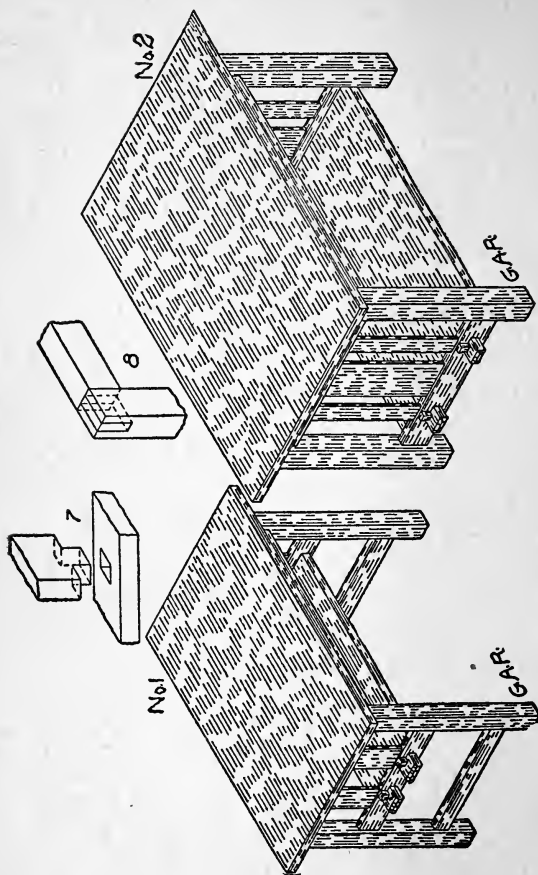


PLATE No. 20

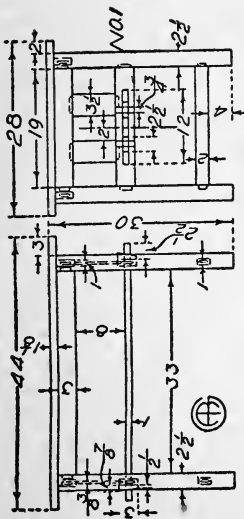


Plate 20

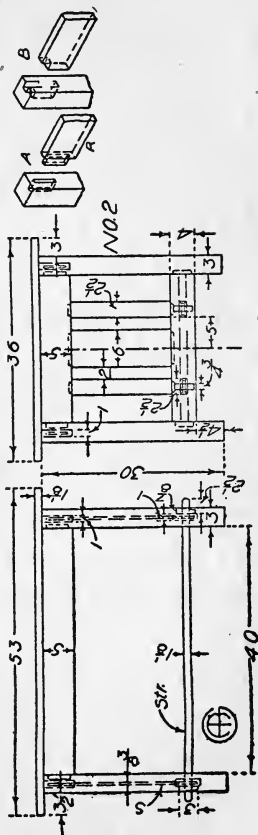


PLATE No. 20

in the middle of the tenons, 15-16 inch from the shoulder of the tenons. The cross piece through which the tenons pass is 1 inch thick. The 1-16 inch less in the mortise is to insure the keys' pulling the shelf tightly against the side of the cross pieces. The tops can be fastened to the rails by means of wooden strips, wooden buttons or small iron angles.

To each table may be added drawers if so desired. The making of the drawers will not be found particularly difficult, but it would be better for the beginner who has had but little experience in handling tools to omit these for the present, or else carefully examine some good table and note how the drawers are constructed and held in place.

The drawings specify that the slats be  $\frac{3}{8}$  inch, but the same may be a thicker material, as the taste or the opinion might be. The table tops may be faced with leather. This method is generally followed with



more massive tables of which No. 2 is an example. The color of the leather chosen should blend with and emphasize the tone of the wood.

Large, round headed brass nails are often used to fasten the strip that finishes the rim and add much to the color, value, and decorative quality of a library table. Do not attempt the finishing of any piece unless the same has been thoroughly scraped, sandpapered and cleaned. See articles III and IV.

The illustration in figure 7 is that of a common mortise and tenon joint. The same is made by cutting two sides of the tenon beam. For the lower ends of stud-ding, or upright pieces, to prevent lateral motion, it is often applied with much satisfaction by carpenters in house building.

Figure 8 is a good example of an end, open, box or slip mortise and tenon joint. Look to window screens and light frames for this joint. This same joint multiplied

is found on a chalk box. Such a joint in the multiplied state is machine made and can not be attempted with a common sloyd knife as is tried by pupils in the fifth and sixth grades of some of the public schools.

“We are not sent into the world to do anything into which we can not put our hearts.”

## BEDS

### ARTICLE XXI

Every one knows that the furnishing of a home would be incomplete without the bed. It is because of this fact that the pieces of furniture, as shown on this page, are expected to receive a hearty welcome in this series of drawings on furniture-making for amateurs.

The foot end of bed No. 1 is 41 inches high and 42 inches wide. The head end is 46 inches high and 42 inches wide. The two side rails or stretchers are 75 inches in length.

For fastening the side stretchers on both beds, patent devices must be purchased at some hardware dealer.

The foot end of bed No. 2 is 42 inches high and 48 inches wide, i. e., between posts. The head end is 48 inches high and 48 inches wide. The stretchers are 78 inches.

The drawings require that strips one-inch square running their whole length be screwed to the inner sides of the stretchers. Slats about three inches wide are to be placed upon these cleats or strips. Small blocks are nailed on either side of the slats.

Bed No. 1 requires the following pieces mill planed and sandpapered.

### **Foot End**

Two posts— $2\frac{1}{4} \times 2\frac{1}{4} \times 41\frac{1}{2}$  inches.

One rail (top)— $1 \times 3 \times 43\frac{1}{2}$  inches.

One rail (bottom)— $1 \times 6\frac{1}{2} \times 43\frac{1}{2}$  inches.

Three vertical slats— $\frac{3}{8} \times 6\frac{1}{2} \times 19$  inches.

Four vertical slats— $\frac{3}{8} \times 3\frac{1}{2} \times 19$  inches.

### **Head End**

Two posts— $2\frac{1}{4} \times 2\frac{1}{4} \times 46\frac{1}{2}$  inches.

One rail (top)— $1 \times 3 \times 43\frac{1}{2}$  inches.

One rail (bottom)— $1 \times 6\frac{1}{2} \times 43\frac{1}{2}$  inches.

Three vertical slats— $\frac{3}{8} \times 6\frac{1}{2} \times 23\frac{1}{2}$  inches.

Four vertical slats— $\frac{3}{8} \times 3\frac{1}{2} \times 23\frac{1}{2}$  inches.

Two side stretchers— $1 \times 6\frac{1}{2} \times 76$  inches.

Two cleats— $1 \times 1 \times 75\frac{1}{2}$  inches.

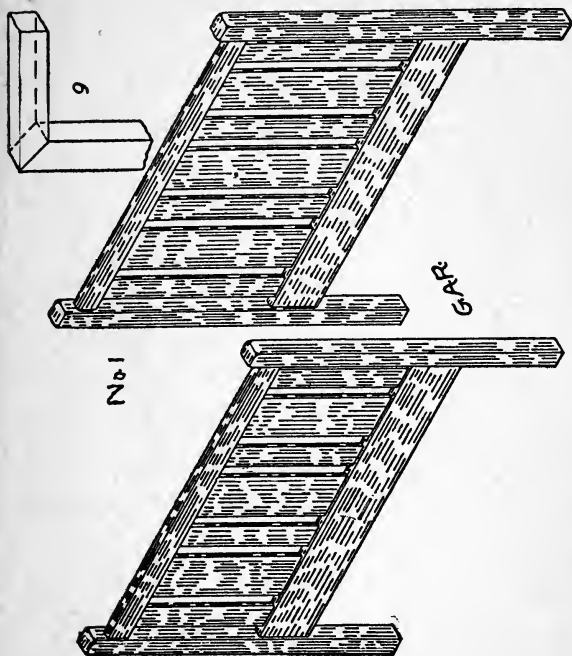


PLATE No. 21

The number of slats needed upon which the spring is placed is left to the good judgment of the worker. The same should

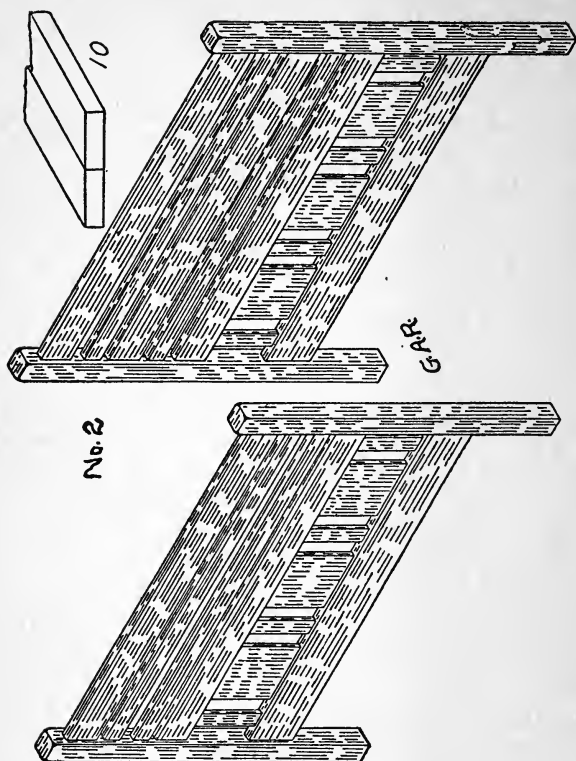
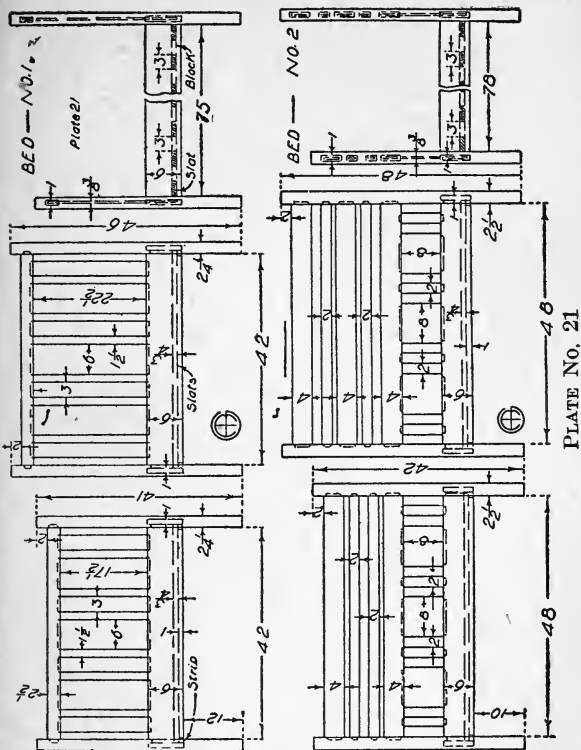


PLATE No. 21

be made about 3 inches wide. One or two long strips  $\frac{3}{4} \times \frac{3}{4}$  inches should be ordered for the small blocks fastened on the cleats



and the inner sides of the long stretchers.

Order the following pieces for bed No. 2:

### Foot End

Two posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 42\frac{1}{2}$  inches.

Two rails— $1 \times 4\frac{1}{2} \times 49\frac{1}{2}$  inches.

Two rails— $1 \times 2\frac{1}{2} \times 49\frac{1}{2}$  inches.

One rail (bottom)— $1 \times 6\frac{1}{2} \times 49\frac{1}{2}$  inches.

Three vertical slats— $\frac{3}{8} \times 8\frac{1}{2} \times 9$  inches.

Four vertical slats— $\frac{3}{8} \times 2\frac{1}{2} \times 9$  inches.

### Head End

Two posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 48\frac{1}{2}$  inches.

Three rails— $1 \times 4\frac{1}{2} \times 49\frac{1}{2}$  inches.

Two rails— $1 \times 2\frac{1}{2} \times 49\frac{1}{2}$  inches.

One rail— $1 \times 6\frac{1}{2} \times 49\frac{1}{2}$  inches.

Three vertical slats— $\frac{3}{8} \times 8\frac{1}{2} \times 9$  inches.

Four vertical slats— $\frac{3}{8} \times 2\frac{1}{2} \times 9$  inches.

Two side stretchers— $1 \times 6\frac{1}{2} \times 79$  inches.

Provide for two cleats, a number of slats for spring and strips for small blocks.

### Common Joints

Illustration 9 is that of a plain miter joint in which the beveled edges or ends abut and are simply glued or nailed to-



gether. For examples of this joint examine picture frames.

Illustration 10 is that of a plain or rubbed joint. Such a joint has the edges of two boards glued together tightly. Plain tables have these joints applied to the tops.

### **How to Apply a Finish to Oak**

A satisfactory finish can be obtained by applying a coat of brown Flemish water stain partly diluted. When dry, sandpaper surface with No. 00 paper. Sandpaper with the grain. A coat of dark filler should then follow.

When the filler has hardened, a thin coat of shellac is to be put on. When the latter has dried, the same should be sandpapered lightly and one or two coats of wax applied and polished.

Directions for using filler and wax can be found upon the cans in which the materials are purchased. The above methods

if followed, will result in obtaining a beautiful dull gloss so much sought by finishers of modern furniture.

## DAVENPORTS

### ARTICLE XXII

From the beginning, in presenting this series of furniture drawings, the author has given close attention to creating only such designs wherein refinement of outline and harmony of details are conspicuously regarded. A glance at the settles or davenport shown herewith will substantiate this fact.

The following stock list of materials should be ordered mill planed and sand-papared for davenport No. 1 as illustrated. Oak is the most suitable wood for this piece of mission furniture.

Four posts— $1\frac{3}{4} \times 1\frac{3}{4} \times 32\frac{1}{2}$  inches.

One rail (top)— $1 \times 4\frac{1}{2} \times 71\frac{1}{2}$  inches.

Two rails (front and rear)— $1 \times 5 \times 71\frac{1}{2}$  inches.

Two end rails— $1 \times 4\frac{1}{2} \times 25\frac{1}{2}$  inches.

Two end rails— $1 \times 7\frac{1}{2} \times 25\frac{1}{2}$  inches.

Eight slats— $\frac{1}{2} \times 2\frac{1}{2} \times 18\frac{1}{2}$  inches.

Seven slats— $\frac{1}{2} \times 3\frac{1}{2} \times 18\frac{1}{2}$  inches.

Eight end slats— $\frac{1}{2} \times 1\frac{1}{2} \times 18\frac{1}{2}$  inches.

Six end slats— $\frac{1}{2} \times 3\frac{1}{2} \times 18\frac{1}{2}$  inches.

Two cleats— $1 \times 1 \times 70$  inches.

Provide for slats to be placed upon cleats if cushions are desired without springs. They should be about  $\frac{1}{2}$  inch thick and 2 inches wide.

All rails and slats are mortised into place for a depth of  $\frac{5}{8}$  inch or more. When joining the pieces, glue should be used. Nails (brads or finishing nails), can be driven into the posts intersecting the tenons of the rails on the inside. The same will not show and will help to make the davenport more solid. It is best, however, to drive the nails a short distance into the wood by means of a nail set or nail punch.

The following pieces should be ordered as above for davenport No. 2:

Four posts— $2\frac{1}{2} \times 2\frac{1}{2} \times 31\frac{1}{2}$  inches.

Two rails, front and rear— $1 \times 5\frac{1}{2} \times 83\frac{1}{2}$  inches.

One rail— $1 \times 8\frac{1}{2} \times 83\frac{1}{2}$  inches.

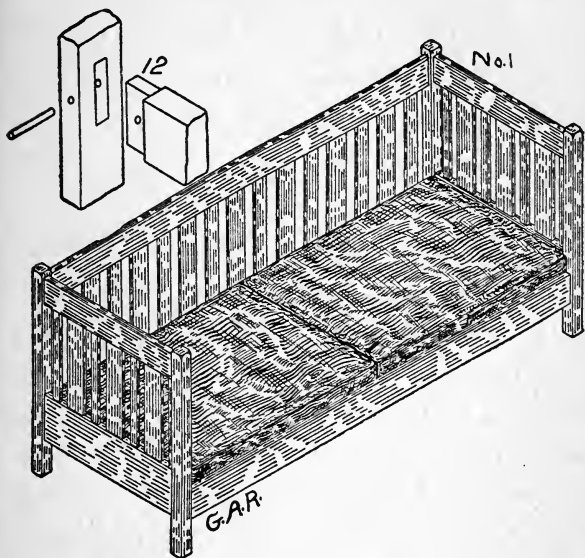


PLATE No. 22

One rail— $1 \times 3\frac{1}{2} \times 83\frac{1}{2}$  inches.

Four end rails— $1 \times 4 \times 29\frac{1}{2}$  inches.

Six slats— $\frac{1}{2} \times 4\frac{1}{2} \times 22$  inches.

Two cleats—1x1x82 inches.

Provide for slats for cushions as stated

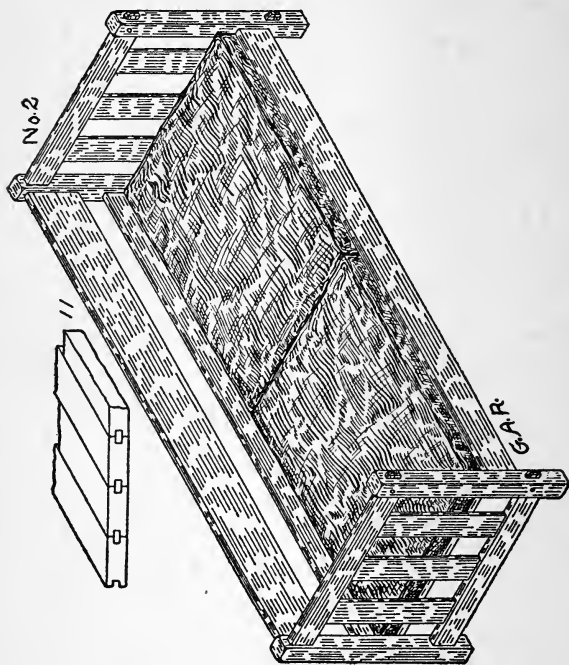
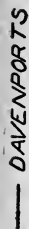


PLATE No. 22

above. See articles 10, 14, 15 and 19 for aid in making and providing for the cushions.



## Plate 22

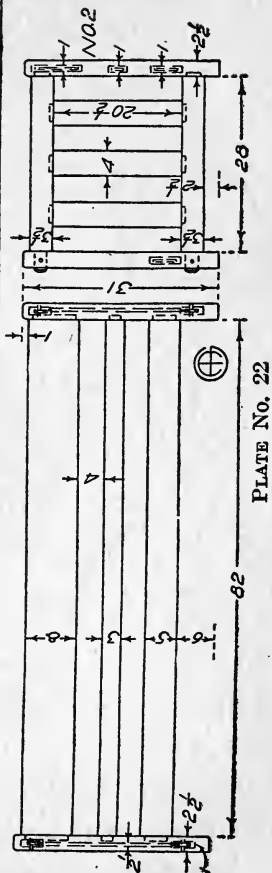
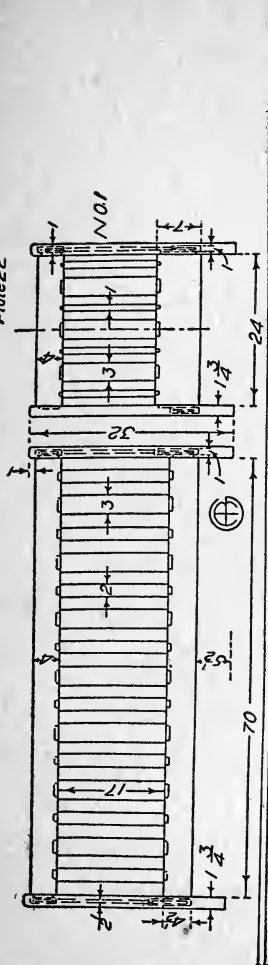


PLATE No. 22

Illustration 11 is that of a spline joint. The same is made by plowing corresponding grooves in the edges of each board to be joined. A spline or slip feather is inserted in each groove.

Illustration 12 is an example of a pinned mortise and tenon joint. In such a joint a pin is driven through the mortised beam and through the tenon to keep them from drawing apart. The cheeks of the tenons may be cut on two or four sides. The joint is used on the end rails in davenport No. 2.

### **Some Woods and Their Characteristics**

Yellow poplar, sometimes called tulip tree or whitewood, is found to be usually light, soft, stiff and of fine texture. The same is not strong.

Black walnut is hard, heavy, strong and coarse grained. It is easily worked, but will check if not carefully seasoned. Chocolate brown is the color of this wood.

Ash resembles oak, but is coarser, and



less attractive than oak. It is also easier to work than oak.

Beechwood has close grain, is hard, strong, heavy, works well and takes a good polish.

White oak is hard and liable to check unless carefully seasoned. The bark has a grayish white color. It is one of the most valuable woods in general use.

Red oak is coarser in texture than white oak and is often brittle. It is also more porous, less durable and more difficult to season.

Maple wood is heavy, hard, strong, tough and of fine texture. The same is often wavy grained and takes a fine polish.

Sugar maple, in which, blister, bird's eye and sometimes curly effects are found, is the hardest variety of maple known.

The silver or white maple is softer than sugar maple, lighter in color and less in weight.

White pine is soft, light, not strong, close,

straight grained, easy to work and takes a good polish.

Pines have long, smooth, straight and solid trunks.

Hard pine, yellow pine or long leaved pine wood is heavy, tough, hard, strong, coarse grained and durable.

Black spruce wood is light, soft and not strong, straight grained and satiny. The same contains considerable resin.

White spruce wood has characteristics general to those of black spruce with the exception that its color is light. Cypress wood is light, soft, close, straight grained, not strong, resinous, and easily worked. It has a color between light and dark brown.

Hemlock wood is light, soft, stiff, brittle, coarse grained and inclined to splinter. The same has a reddish gray color, shrinks and warps considerably, wears rough, but retains nails firmly.

## BOOKCASES

### ARTICLE XXIII

The two bookcases shown on this page are comparatively easy to make. The shelves of bookcase No. 2 should be made adjustable, thus facilitating the shelving of books of different dimensions.

Order the following pieces of white oak or quarter sawed oak, planed and sand-papered on both sides for bookcase No. 1:

Two sides— $\frac{7}{8} \times 12\frac{1}{2} \times 48\frac{1}{2}$  inches.

Two shelves— $\frac{7}{8} \times 12 \times 19\frac{1}{2}$  inches.

One shelf (bottom)— $\frac{7}{8} \times 12\frac{1}{2} \times 19\frac{1}{2}$  inches.

One shelf (top)— $\frac{7}{8} \times 14 \times 19\frac{1}{2}$  inches.

For door:

Two pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 28\frac{1}{2}$  inches.

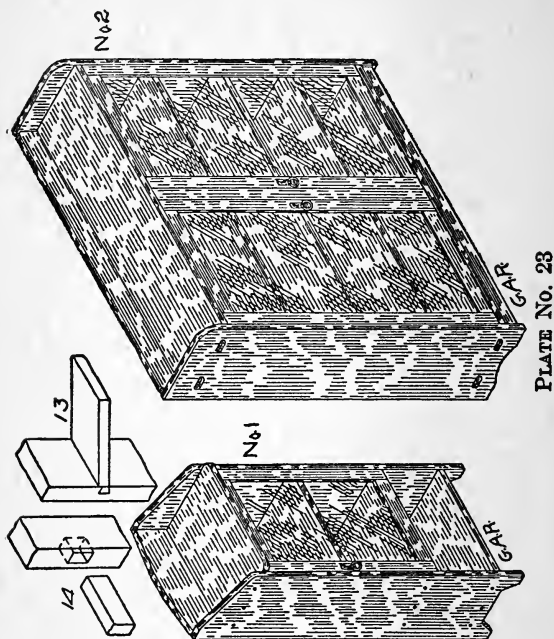
Two pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 16\frac{1}{2}$  inches.

For rear:

One piece (top)— $\frac{7}{8} \times 6\frac{1}{2} \times 19\frac{1}{2}$  inches.

One piece (bottom)— $\frac{7}{8} \times 4\frac{1}{2} \times 19\frac{1}{2}$  inches.

Panel (made from several pieces)— $\frac{3}{8}$ x  
19 $\frac{1}{2}$ x36 inches.

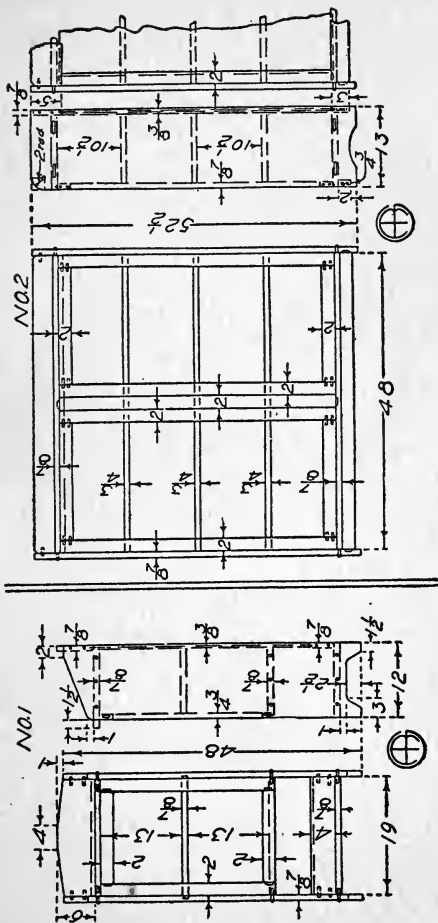


Bookcase No. 2 requires the following pieces from the mill:

Two sides— $\frac{7}{8}$ x13 $\frac{1}{2}$ x53 inches.

—BOOK CASES—

## Plate 23



Two shelves (top and bottom)— $\frac{7}{8} \times 13 \times 50\frac{1}{2}$  inches.

Three shelves— $\frac{3}{4} \times 13 \times 48\frac{1}{2}$  inches.

One strip (bottom)— $\frac{3}{4} \times 21\frac{1}{2} \times 49\frac{1}{2}$  inches.

The doors:

Four pieces— $\frac{7}{8} \times 21\frac{1}{2} \times 45$  inches.

Four pieces— $\frac{7}{8} \times 21\frac{1}{2} \times 19\frac{1}{2}$  inches.

Center piece— $\frac{7}{8} \times 21\frac{1}{2} \times 45\frac{1}{2}$  inches.

The rear:

One piece (top)— $\frac{7}{8} \times 51\frac{1}{2} \times 48\frac{1}{2}$  inches.

One piece (bottom)— $\frac{7}{8} \times 31\frac{1}{2} \times 49\frac{1}{2}$  inches.

Panel, made from several pieces— $\frac{3}{8} \times 48\frac{1}{2} \times 45$  inches.

The tenons of the top and bottom shelves of bookcase No. 2 project through the side pieces.

Figure 13 is an illustration of a dovetail dado joint. One side of the inserted piece is cut on an angle. Both sides can thus be cut if desired. The dovetailed piece must slide in place. The same can not be pulled out sidewise.

In adjusting fixed shelves of a bookcase,

as required in No. 1, a dovetail dado joint will serve most satisfactorily.

Figure 14 is that of a housed mortise and tenon joint. One end of one piece of lumber is "let in" or "housed" into another for a short distance.

### How Trees Are Classified

Woodworkers divide timber into two kinds: The "broad leaved" and the "conifer" or "needle leaved." Oak, ash, maple, birch, poplar, and chestnut come under the "broad leaved" class, while the fir and cedar are "needle leaved."

In botany trees are divided into two general classes: Exogens and endogens. The same differ in the way the woody part is arranged in the cellular tissue of each stem.

Endogenous means inside growing. The wood in endogenous stem, such as a corn stalk, is all in separate threads or bundles of fibers running lengthwise, and scattered

among the cellular tissue throughout the whole thickness of the stem. A cross section appears dotted on the cut end. Examples of this class are found among the palmettos, yucca, asparagus shoots, and bamboos.

The exogenous stems furnish the woods useful in construction and are the kind we are familiar with in ordinary wood. It is this class that the woodworker subdivides into "broad leaved" and "needle leaved" trees, or conifers.

In exogenous stems each year a new layer of wood is formed on the outside of the trunk and branches, underneath the bark, and the age of the tree may usually be determined by counting the number of layers. The increase is all on the surface and buries the older wood deeper and deeper in the trunk. Exogenous means outside growing. In the center of the tree there is always a small whitish part, called the "pith." The wood nearest the pith is con-



siderably harder and darker in color than that which is on the outside nearer the bark. This is called "heartwood." The other, which is the newest and freshest, is called the "sapwood." It is at the circumference, just beneath the bark.

## WRITING DESKS

### ARTICLE XXIV

Desk No. 1 has its horizontal pieces held in place by means of pegs or keys. The pieces of No. 2 are doweled. The dowel pins pass through the side pieces to their outer surfaces. No. 2 is provided with a drawer.

Order the following pieces of oak for desk No. 1:

Two sides— $\frac{7}{8} \times 12\frac{1}{2} \times 49\frac{1}{2}$  inches.

One (top) shelf— $\frac{3}{4} \times 8\frac{1}{2} \times 33$  inches.

One (second) shelf— $\frac{3}{4} \times 11 \times 33$  inches.

One (bottom) shelf— $\frac{3}{4} \times 12 \times 33$  inches.

Six keys (in one strip)  $\frac{3}{4} \times \frac{3}{4} \times 20$  inches.

Each key is  $\frac{3}{4} \times \frac{3}{4} \times 3$  inches.

The front or writing board should be made from several pieces to assure strength and avoid warping. The same needs:

Two vertical pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 16\frac{1}{2}$  inches.

Two horizontal pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 23$  inches.

One vertical piece— $\frac{3}{4} \times 3\frac{1}{2} \times 11$  inches.

The other horizontal pieces should be about  $\frac{3}{4}$  inch thick, about  $2\frac{1}{2}$  inches wide and about  $10\frac{1}{2}$  inches long. The front board should be made similar in construction to that of a drawing board. The rear of desk No. 1 requires one piece  $\frac{3}{4} \times 5 \times 28\frac{1}{2}$  inches. One panel composed of several pieces,  $\frac{3}{8} \times 28\frac{1}{2} \times 33\frac{1}{2}$  inches.

Order the following pieces at the mill for desk No. 2:

Two posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 24$  inches.

Two posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 51\frac{1}{2}$  inches.

The sides are made up of two pieces 14 inches wide.

Order two pieces  $\frac{7}{8} \times 5\frac{1}{2} \times 25$  inches and the other two  $\frac{7}{8} \times 9\frac{1}{2} \times 17\frac{1}{2}$  inches.

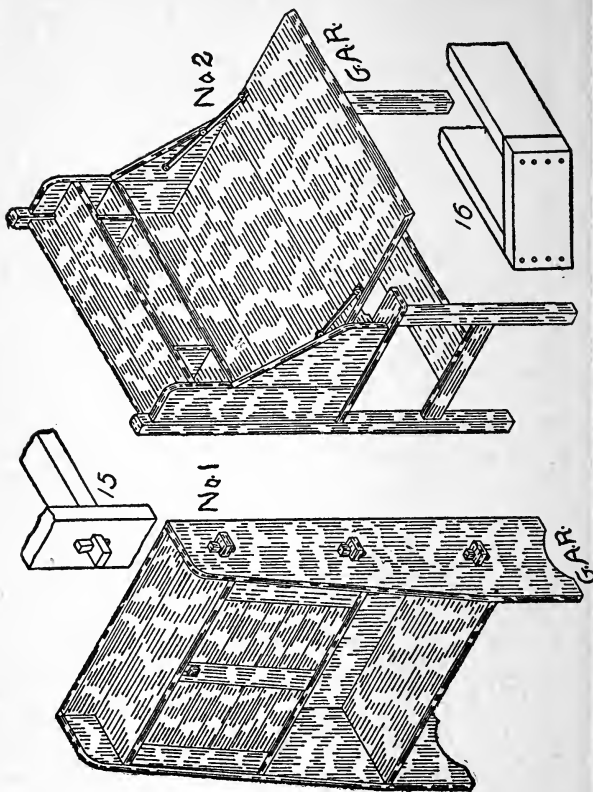
One (first) shelf— $\frac{3}{4} \times 5\frac{1}{2} \times 30\frac{1}{2}$  inches.

One (second) shelf— $\frac{3}{4} \times 5\frac{1}{2} \times 30\frac{1}{2}$  inches.

One (third) shelf— $\frac{3}{4} \times 14 \times 30\frac{1}{2}$  inches.

Two stretchers (on side connecting posts)

$\frac{3}{4} \times 2\frac{1}{2} \times 16\frac{1}{2}$  inches.



One board or stretcher— $\frac{3}{4} \times 6\frac{1}{2} \times 30\frac{1}{4}$  inches.

DESKS

Plate 24

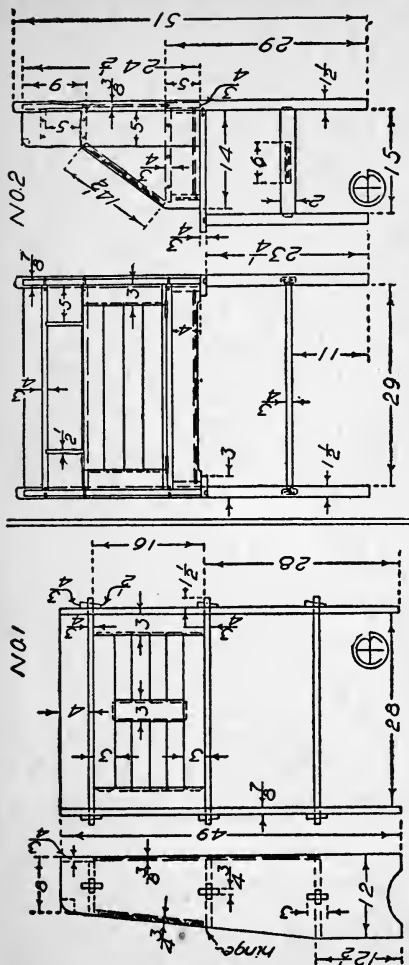


PLATE No. 24

Two pieces (between upper two shelves)  
— $\frac{1}{2} \times 6 \times 6$  inches.

Two pieces (upon which drawer slides) —  
 $\frac{3}{4} \times 3\frac{1}{2} \times 18$  inches.

The front or writing board:

Two pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 15$  inches.

Four horizontal pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 24\frac{1}{2}$   
inches.

The rear has:

One piece— $\frac{3}{4} \times 9\frac{1}{2} \times 29\frac{1}{2}$  inches.

One piece— $\frac{3}{4} \times 5\frac{1}{2} \times 29\frac{1}{2}$  inches.

One panel— $\frac{3}{8} \times 29\frac{1}{2}$  (wide)  $\times 13$  inches.

The drawer (front)— $\frac{3}{4} \times 4\frac{1}{2} \times 30\frac{1}{2}$  inches.

Sides— $\frac{3}{4}$  (or less)  $\times 4\frac{1}{2} \times 12$  inches.

Rear— $\frac{3}{4} \times 3\frac{1}{2} \times 30\frac{1}{2}$  inches.

Bottom (soft wood)— $\frac{3}{8} \times 12\frac{1}{2} \times 30$  inches.

Examine some drawer about the home and observe its construction. Trimmings, such as knobs, hinges and supports, must also be provided for in the making of both desks. Pigeon holes have not been shown in the drawings of either desk. The same may be added and arranged according to

individual taste. The material chosen should be  $\frac{3}{8}$  inch thick and soft wood.

Figure 15 shows the construction of a keyed mortise and tenon joint. The tenon of one piece protrudes through the mortise of the other piece far enough to receive a removable peg or key. The key must be tapered in order to draw up tightly the mortised piece.

Desk No. 1 has this joint applied to its shelves. Other examples can be found in this series of drawings on furniture making.

Figure 16 is an illustration of a plain butt joint. The same is made by joining pieces edgewise or endwise without overlapping any parts. Examples of such a joint can be found on simple frame boxes.

### **The Grain of Wood**

The woodworker speaks of woods as fine grained, cross grained, coarse grained, or straight grained.

Wood is said to be fine grained when the annual rings are relatively narrow, and coarse grained when these rings are wide. It will be found that fine grained wood will generally take a high polish, while with coarse grained wood this is not always possible.

Wood is said to be straight grained when the fibers are straight and parallel to the direction of the trunk of the tree. If the fibers of wood are distorted or twisted so as to be spiral in form, and the growing follows up around the trunk of the tree, the wood is said to be cross grained.



## CHINA CLOSET AND BUFFET

### ARTICLE XXV

Again, in presenting the two pieces of furniture shown in plate 25, the author has sought an artistic treatment of straight lines. The construction of this furniture as directed will no doubt give lasting satisfaction in any home.

The china cabinet will require the following pieces (plain white oak or quarter-sawed oak) planed and sandpapered, from the mill:

Four posts— $1\frac{1}{2} \times 1\frac{1}{2} \times 56\frac{1}{2}$  inches.

One top— $\frac{7}{8} \times 19\frac{1}{2} \times 43$  inches.

#### The Door

Two vertical pieces— $\frac{3}{4} \times 3 \times 46\frac{1}{2}$  inches.

Two horizontal pieces— $\frac{3}{4} \times 3 \times 30\frac{1}{2}$  inches.

Three mullion strips— $\frac{3}{4} \times 1\frac{1}{2} \times 42\frac{1}{2}$  inches.

The short mullion strips should be ordered in longer strips, thus:

Three horizontal strips— $\frac{3}{4} \times 1\frac{1}{2} \times 30$  inches.

One stretcher (bottom)— $\frac{3}{4} \times 3\frac{1}{2} \times 35\frac{1}{2}$  inches.

### For Sides

Four vertical pieces— $\frac{3}{4} \times 3 \times 46\frac{1}{2}$  inches.

Four horizontal pieces— $\frac{3}{4} \times 3 \times 10\frac{1}{2}$  inches.

Order two pieces for mullion strips—one for each side.

Two strips— $\frac{3}{4} \times 1\frac{1}{2} \times 32$  inches.

Two stretchers (bottom, sides)— $\frac{3}{4} \times 4\frac{1}{4} \times 15\frac{1}{2}$  inches.

### The Rear

Two vertical pieces— $\frac{3}{4} \times 3 \times 46\frac{1}{2}$  inches.

One center piece— $\frac{3}{4} \times 3\frac{1}{2} \times 46\frac{1}{2}$  inches.

Six pieces (horizontal)— $\frac{3}{4} \times 3\frac{1}{2} \times 14\frac{1}{2}$  inches.

Eight panel pieces— $\frac{3}{8} \times 9 \times 14$  inches.

One upper strip— $\frac{3}{4} \times 3 \times 35\frac{1}{2}$  inches.

One lower strip— $\frac{3}{4} \times 3 \times 35\frac{1}{2}$  inches.

One stretcher (bottom)— $\frac{3}{4} \times 3\frac{1}{2} \times 35\frac{1}{2}$  inches.

Three shelves— $\frac{3}{4} \times 15\frac{1}{2} \times 35$  inches.

One bottom shelf— $\frac{7}{8} \times 17 \times 35$  inches.

The door frame and side frames should be provided with glass. All parts are assembled by means of mortise and tenon joints.

For the buffet shown in drawing No. 2 order the following material from the mill:

Four posts— $2 \times 2 \times 43$  inches.

Four stretchers— $\frac{3}{4} \times 2 \times 53$  inches.

(These are tenoned on the ends, passed through the mortises in the posts and held in place with dowel pins.)

Two shelves— $\frac{3}{4} \times 17\frac{1}{2} \times 49\frac{1}{2}$  inches.

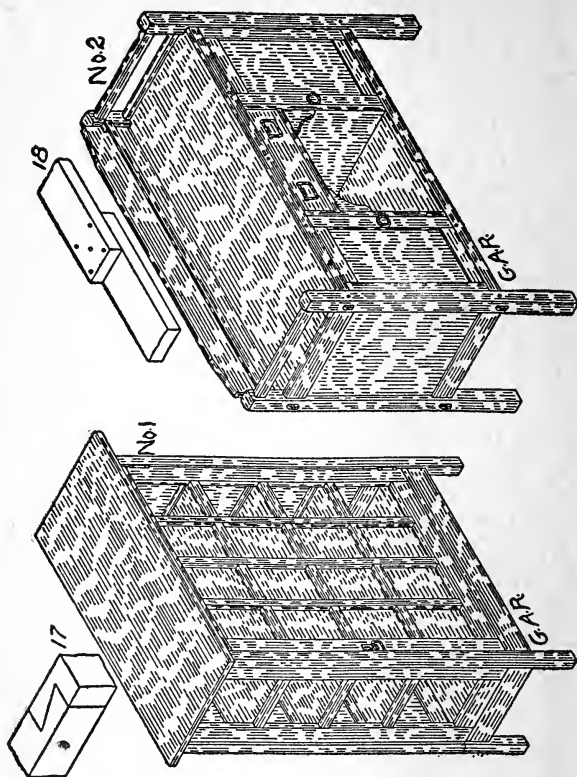
### **Two Doors**

Four vertical pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 23$  inches.

Four horizontal pieces— $\frac{3}{4} \times 2\frac{1}{2} \times 11\frac{1}{2}$  inches.

Two panels— $\frac{3}{8} \times 11 \times 19$  inches.

One shelf (beneath drawer)— $\frac{3}{4} \times 18\frac{1}{2} \times 19$  inches.



Two brackets— $\frac{3}{4}$  or less x  $4\frac{1}{2}$  x  $5\frac{1}{2}$  inches.

Two pieces, S— $\frac{3}{4}$  x  $18\frac{1}{2}$  x 23 inches.

Drawer:

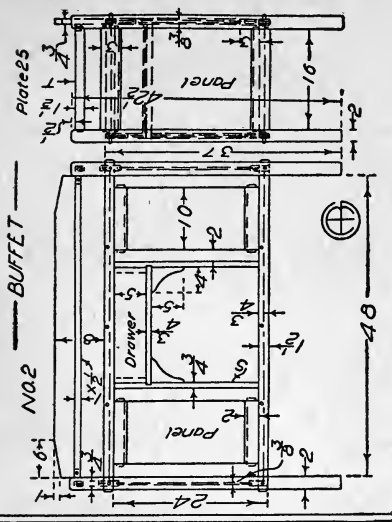
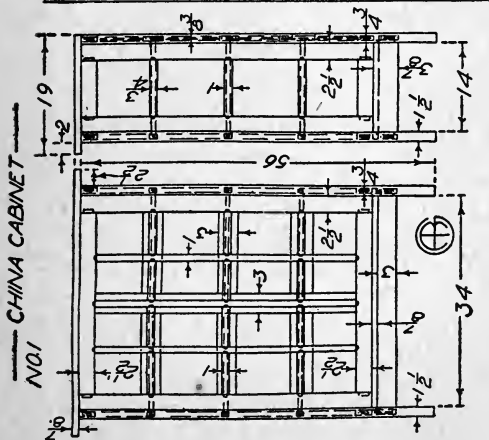


PLATE No. 25

Front— $\frac{3}{4}$  or  $\frac{7}{8} \times 5\frac{1}{2} \times 18\frac{1}{2}$  inches.

Sides— $\frac{3}{4}$  or  $\frac{7}{8} \times 5\frac{1}{2} \times 18\frac{1}{2}$  inches.

Rear board— $\frac{3}{4} \times 5 \times 18\frac{1}{2}$  inches.

Bottom— $\frac{3}{8} \times 17\frac{1}{2} \times 17\frac{1}{2}$  inches.

### **The Sides**

Two pieces, T— $\frac{3}{4} \times 2 \times 17\frac{1}{4}$  inches.

Four pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 17\frac{1}{2}$  inches.

Two panel pieces— $\frac{3}{8} \times 16\frac{1}{2} \times 21$  inches.

### **The Rear**

One top piece— $\frac{3}{4} \times 8\frac{1}{2} \times 48\frac{1}{2}$  inches.

Two horizontal pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 42\frac{1}{2}$  inches.

Two vertical pieces— $\frac{3}{4} \times 3\frac{1}{2} \times 23$  inches.

One center piece (vertical)— $\frac{3}{4} \times 3\frac{1}{2} \times 17\frac{1}{2}$  inches.

Two panel pieces— $\frac{3}{8} \times 20 \times 17$  inches.

The lines of rear pieces are not shown in the front view, because in so doing the drawing would become confusing and too intricate for amateurs. The explanation for all pieces of the rear, as given above, ought to suffice.

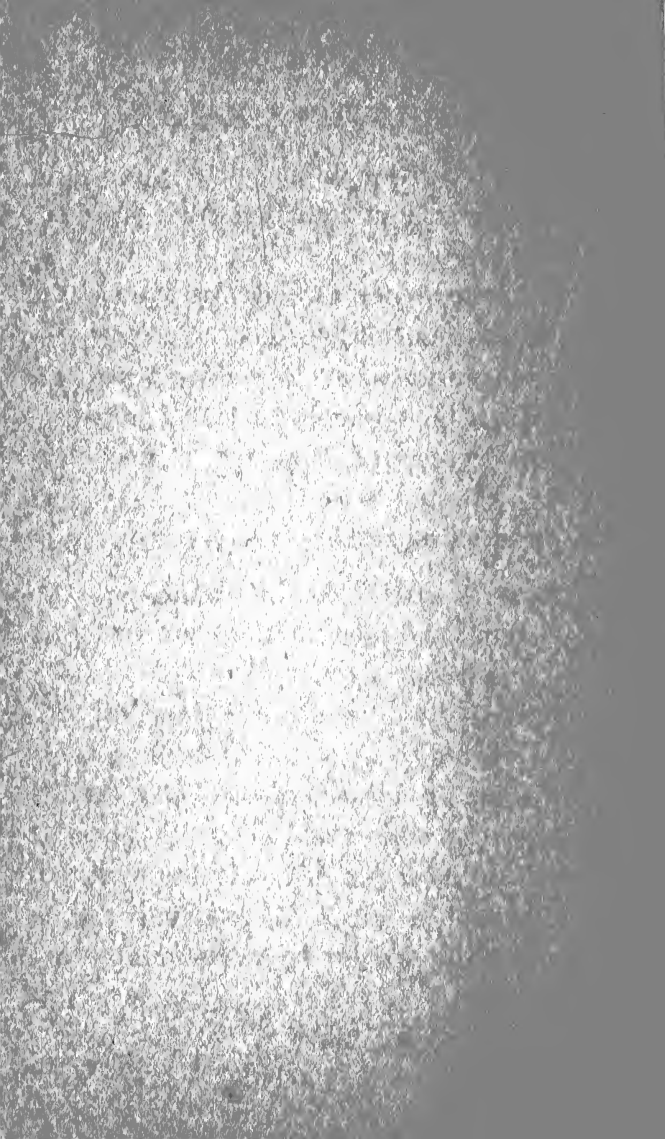
Also order one plate rail strip— $\frac{1}{2} \times 1\frac{1}{2} \times$

48½ inches. About one-half inch has been allowed in all mill orders on every piece of lumber on width and length for waste in planing and sawing.

Illustration 17 is a modification of a "halved" splice, but because of its structure is somewhat more effective. Such a method of connecting timber is called a "beveled" splice and the cuts are made on a bevel in such a manner that the parts fit accurately when placed together.

Illustration 18 is an example of the simplest of splices. Amateurs should not misconstrue joints for splices. The difference lies therein that a "splice" has the connection between two pieces extending in the same direction, as shown in the drawings. It will also be noticeable that each piece connected is a continuation of the other.

Any connection between two pieces which come together at an angle, as shown in foregoing articles, and which are therefore continuous, is termed a joint.





## THE FURNITURE MAKER

His name is written on no roll of war  
With stroke of steel and mighty crash  
of arms,

His sturdy step awakens no alarms  
And at his shout no face is clouded o'er  
With sudden terror or descending tears.

He has his triumphs and his victories;  
But Peace and Progress, Praise and  
Plenty—these  
The victories he gathers from the years.

His name is written on the blazing hearth,  
Around the household's cherished in-  
gleside,  
Within the first dear cottage of the  
bride

And on the proudest mansion of the earth.  
His creed is Comfort and his god is Love.  
About our sweet domestic altars lurk  
The gentle spirits of his handiwork—  
These are the scenes he writes his name  
above.

These are the scenes that make the monument

Of this, the gentle craftsman of the Home.

And feet that wander far, and hearts that roam,

Shall often come returning penitent

To worship at old altars he has made—

A mother's rocker or a father's chair—

Finding no edifice afar as fair

As this the simple product of his trade.

Builder of altars in the home and heart,

A labor near divinity is yours,

Yours is the craftsmanship that most endures,

For homes are builded by your honest art.

Think not the service humble from your hand,

But proudly, gratefully, your toil esteem—

For men no greater service do or dream Than building firesides in a happy land.

—Douglas Malloch.

(By courtesy of the Furniture Journal.)

If a man can write a better book, preach a better sermon, or make a better mousetrap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door.—Ralph Waldo Emerson.

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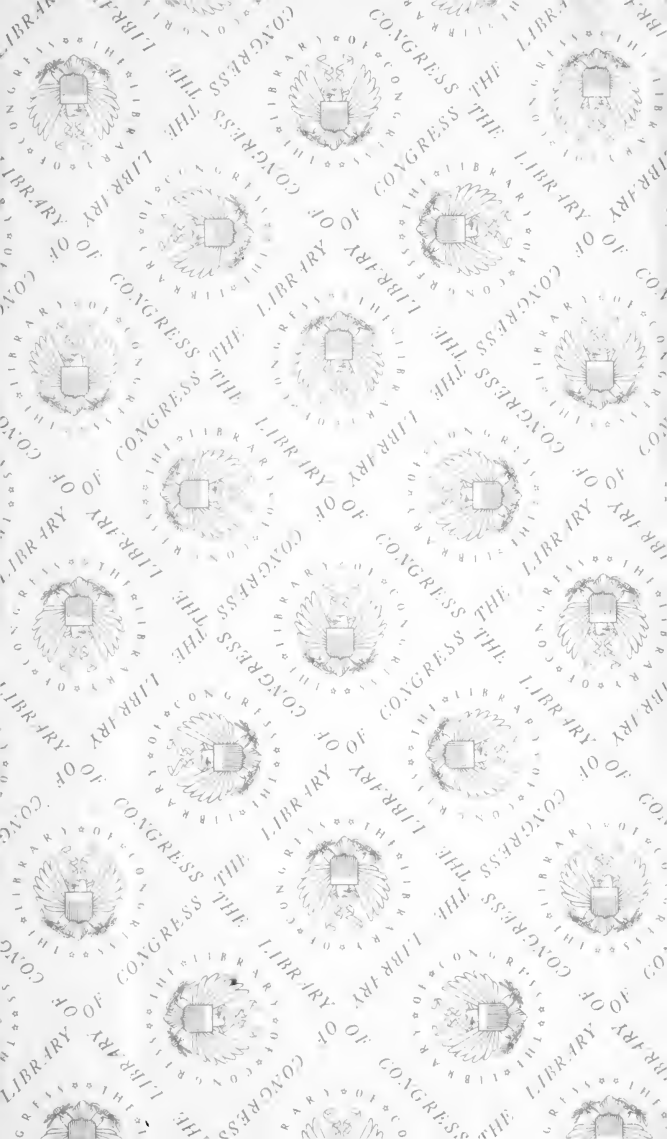




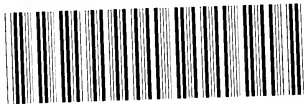








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